Water Resources Survey

Part I:
HISTORY OF LAND AND WATER USE ON IRRIGATED AREAS

and

Part II:
MAPS SHOWING IRRIGATED AREAS IN COLORS DESIGNATING THE SOURCES OF SUPPLY

Lewis and Clark County Montana

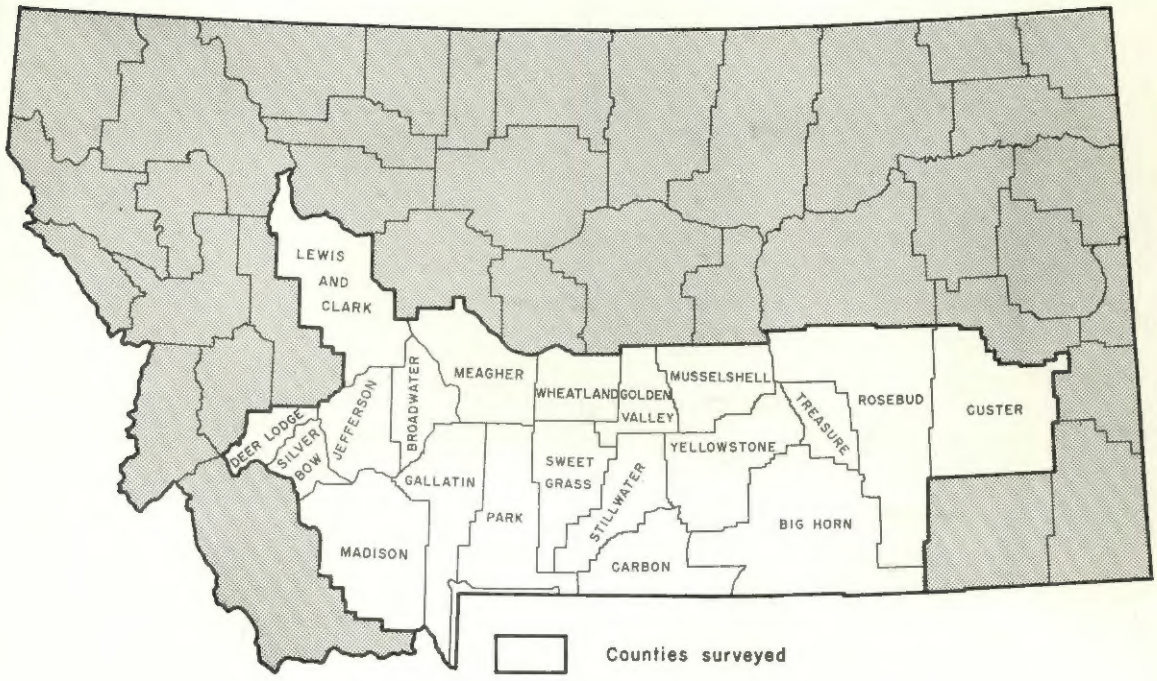
Published by
STATE ENGINEER'S OFFICE
Helena, Montana, June 1957
Reprinted as of June 1965

WATER RESOURCES SURVEY

LEWIS AND CLARK COUNTY MONTANA

PART I

History of Land and Water Use
on Irrigated Areas



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THURBER'S HELENA

June, 1957

Honorable J. Hugo Aronson
Governor of Montana
Capitol Building
Helena, Montana

Dear Governor Aronson:

Submitted herewith is a consolidated report on the Water Resources Survey of Lewis and Clark County, Montana.

This work is being carried on with funds made available to the State Engineer by the 34th Legislative Session, 1955, and in cooperation with the State Water Conservation Board and the Montana State Agricultural Experiment Station.

The report is divided into two parts. Part I consists of history of land and water use, irrigated lands, water rights, etc., and Part II contains the township maps in the county showing in color the lands irrigated from each source or canal system.

Work has been completed and reports are now available for the following counties: Big Horn, Broadwater, Carbon, Custer, Deer Lodge, Gallatin, Golden Valley, Jefferson, Lewis and Clark, Madison, Meagher, Musselshell, Park, Rosebud, Silver Bow, Stillwater, Sweet Grass, Treasure, Wheatland and Yellowstone.

The office files contain minute descriptions and details of each individual water right, water and land use, etc., which are too voluminous to be included herein. These office files are available for inspection to those who are interested.

The historical data on water rights contained in this report can never become obsolete. If new information is added from time to time as new developments occur, the records can always be kept current and up to date.

Respectfully submitted,
FRED E. BUCK, State Engineer

ACKNOWLEDGMENTS

A survey and study of water resources involves many phases of both field and office work in order to gather the necessary data to make the information complete and comprehensive. Appreciation of the splendid cooperation of various agencies and individuals who gave their time and assistance in aiding us in gathering the data for the preparation of this report is hereby acknowledged.

County Officials

J. Morley Cooper, Commissioner — Charles D. Greenfield, Commissioner

R. E. O'Connell, Commissioner

David R. Kemp, Clerk of District Court

Florence T. Fauver, Clerk and Recorder — R. G. Lutey, Assessor

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Clinton Bourne ... "Soils" ... Research Associate, Mont. Agric. Experiment Station

James Sargent ... "Crops and Livestock" ... County Extension Agent

Frank Stermitz ... "Stream Gaging Stations" ... District Engineer, U.S.G.S.

W. C. Ackerman ... "Mining" ... Geologist, Montana School of Mines

Herman Kraus ... "Soil Conservation Districts" ... Work Unit Conservationist, S.C.S.

Eric P. White ... "National Forests" ... District Ranger, U.S. Forest Service

Cliff Ellis ... Secretary, Dearborn Canal and Water Company

W. A. Rossiter ... Secretary, Helena Valley Water Users Association

Albert Hrella ... Secretary, Lakeside Water Users Association

Harold T. Jackson ... Secretary, Nilan Water Users Association

The State Engineer's Office, Water Resources Survey, hereby expresses sincere appreciation to the many ranchers, farmers and stockmen who have given their helpful cooperation in this survey.

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FOREWORD

MONTANA'S WATER RIGHT PROBLEMS

Our concern over surface water rights in Montana is nearly a century old. When the first Territorial Legislature, meeting in Bannack, adopted the common law of England on January 11, 1865, the Territory's legal profession assumed that it had adopted the Doctrine of Riparian Rights. This doctrine had evolved in England and in eastern United States where the annual rainfall is generally more than twenty inches. It gave the owners of land bordering a stream the right to have that stream flow past their land undiminished in quantity and unaltered in quality and to use it for household and livestock purposes. Since the law restricted the use of the water to riparian owners and forbade them to reduce appreciably the stream flow, the early miners and ranchers in Montana favored the Doctrine of Prior Appropriation which permitted diversion and diminution of the streams. Consequently, the next day the legislature enacted a law which permitted diversion by both riparian and non-riparian owners. Whether or not this action provided Montana with one or two definitions of water rights was not settled until 1921 when the Montana Supreme Court in the Mettler vs. Ames Realty Co. case declared the Doctrine of Prior Appropriation to be the valid Montana water right law. "Our conclusion," it said, "is that the common law doctrine of riparian rights has never prevailed in Montana since the enactment of the Bannack Statutes in 1865 and that it is unsuited to the conditions here . . ."

The appropriation right which originated in California was used by the forty-niners to divert water from the streams to placer mine gold. They applied to the water the same rules that they applied to their mining claims—first in time, first in right and limitation of the right by beneficial use. Those who came to the Montana gulches brought with them these rules, applying them to agriculture as well as to mining.

The main points of consideration under the Doctrine of Prior Appropriation are:

1. The use of water may be acquired by both riparian and non-riparian landowners.

2. It allows diversion of water regardless of the reduction of the water supply in the stream.

3. The value of the right is determined by the priority of the appropriation; i.e., first in time is first in right.

4. The right is limited to the use of the water. Stream waters in Montana are the property of the State and the appropriator acquires only a right to their use. Moreover, this use must be beneficial.

5. A right to the use of water is considered real property only in the sense that it can be bought or sold; its owner may not be deprived of it except by due process of law.

The State Legislature has provided methods for the acquisition, determination of priority and administration of the right. No right may be acquired on a stream without diversion of water and its application to a beneficial use. On unadjudicated streams, the Statutes stipulate that the diversion must be preceded by posting a notice at the point of intended diversion and by filing a copy of it within 20 days in the County Clerk's office of the county in which the appropriation is being made. Construction of the means of diversion must begin within 40 days of the posting and continue with reasonable diligence

to completion. However, the Montana Supreme Court has ruled that an appropriator who fails to comply with the Statutes may still acquire a right merely by digging a ditch and putting the water to beneficial use.

To obtain a water right on an adjudicated stream, one must petition the District Court having jurisdiction over that stream for permission to make an appropriation. If the other appropriators do not object, the court gives its consent and issues a supplementary decree granting the right subject to the rights of the prior appropriators.

Inasmuch as the Montana laws do not require water users to make official records of the completion of their appropriations, it becomes advisable, as soon as the demand for the waters of a stream becomes greater than its supply, to determine the rights and priorities of each user by means of an adjudication or water right suit. This action may be initiated by one or more of the appropriators who may make all the other claimants parties to the suit. Thereupon the Judge of the District Court examines the claims of all the claimants and issues a decree establishing priority of the right of each water user and the amount of water he is entitled to use. The court decree becomes in effect the deed of the appropriator to his water right.

Whenever scarcity of water in an adjudicated stream requires an allocation of the supply according to the priority of rights, the Judge upon petition of the owners of at least 15 per cent of the water rights affected must appoint a water commissioner to distribute the water. These rules were formulated to protect the rights. However, they constitute a system of local regulation which imposes such a limited control upon the individual's use of the water that they often fail to protect him.

The recordings of appropriations in local courthouses provide an incomplete record of the water rights on unadjudicated streams. In fact, the county records often bear little relation to the existing situation. Since the law places no restriction on the number and extent of the filings which may be made on an unadjudicated stream, the total amount of water claimed is frequently many times the available flow. There are numerous examples of streams becoming over appropriated. Once six appropriators each claimed all of the water in Lyman Creek near Bozeman. Before the adjudication of claims to the waters of Prickly Pear Creek, 68 parties claimed thirty times its average flow of 50 cfs. Today, the Big Hole River with an average flow of 1,131 cfs has filings totaling 173,912 cfs. A person is unable to distinguish in the county courthouses the perfected rights from the unperfected ones since the law requires no official recordation of the completion of an appropriation. Recognition by the courts of unrecorded appropriations adds to the incompleteness of these records. To further complicate the situation, appropriators have used different names for the same stream in their filings. In Montana many of the streams flow through several counties, consequently, water right filings on these inter-county streams are found distributed in two or more county courthouses. Anyone desirous of determining appropriations on a certain river or creek finds it difficult and expensive to examine records in several places. In addition, the records are sometimes scattered because the original nine counties of 1865 have now increased to 56. As the original counties have been divided and sub-divided, the water right filings have frequently not been transcribed from the records of one county to the other. Thus, the record of an early appropriation in what is at present Powell County may be found in the courthouse of the original Deer Lodge County.

It can be readily seen that this system of recording offers little protection to rights in the use of water until they are determined by an adjudication. In other words, an appropriator does not gain a

clear title to his water right until after adjudication and then the title may not be clear because the Montana system of determining rights is also faulty. In the first place, adjudications are costly, sometimes very costly when they are prolonged for years. It is estimated that litigation over the Beaverhead River, which has lasted more than twenty years, has cost the residents of the valley nearly a half a million dollars. In the second place, unless the court seeks the advice of a competent irrigation engineer, the adjudication may be based upon inaccurate evidence. In the third place, if some claimant has been inadvertently left out of the action, it is not final and may be reopened for consideration by the aggrieved party. Another difficulty arises in determining the ownership of a water right when land under an adjudicated stream becomes sub-divided in later years and the water not proportioned to the land by deed or otherwise. There is no provision made by law requiring the recording of specific water right ownerships on deeds and abstracts.

There is no provision of law for the distribution of water from an unadjudicated stream. Administration of water on an adjudicated stream is done by the District Court, but it has its drawbacks. The appointment of a water commissioner is often delayed until the shortage of water is acute and the court frequently finds it difficult to obtain a competent man for a position so temporary. The present administration of adjudicated streams which cross the county boundaries of judicial districts creates problems. Many of the water decrees stipulate headgates and measuring devices for proper water distribution, but in many instances the stipulation is not enforced, causing disagreement among the water users.

Since a water right is considered real property and may be bought and sold, the nature of water requires certain limitations in its use. One of the major faults affecting a stream after an adjudication is the failure of the District Court to have some definite control over the transfer of water rights from their designated place of use. The sale and leasing of water is becoming a common practice on many adjudicated streams and has created serious complications. By changing the water use to a different location, many of the remaining rights along the stream are disrupted, resulting in a complete breakdown of the purpose intended by the adjudication. To correct this situation, legal action must be initiated by the injured parties as it is their responsibility and not the Court's.

At one time or another all of the other Western Reclamation States have used similar methods of local regulation of water rights. Now all of them except Montana have more or less abandoned these practices and replaced them by a system of centralized state control such as the one adopted by the State of Wyoming. The key characteristics of the Wyoming system is the registration of both the initiation and completion of an appropriation in the State Engineer's Office, the determination of rights and administration by a State Board of Control headed by the State Engineer. These methods give the Wyoming water users titles to the use of water as definite and as defensible as those which they have to their land.

When Montana began to negotiate the Yellowstone River Compact with Wyoming and North Dakota in 1939, the need for some definite information concerning our water and its use became apparent. The Legislature in 1939 passed a bill (Ch. 185) authorizing the collection of data pertaining to our uses of water and it is under this authority that the Water Resources Survey is being carried on. The purpose of this survey is six fold: (1) To catalogue counties, in the office of the State Engineer, all recorded, appropriated and decreed water rights including use rights as they are found; (2) to map the lands upon which the water is being used; (3) to provide the public with pertinent water right information on any stream, thereby assisting in any transaction where water is involved; (4) to help State and Federal Agencies in pertinent matters; (5) to eliminate unnecessary court action in water right dis-

putes; (6) and to have a complete inventory of our perfected water rights in case we need to defend these rights against the encroachments of lower states.

In conclusion, some mention should be made regarding the enactment of laws for the orderly development of our ground water supplies. Delay in the enactment of these laws by other states has contributed to the over-development of these valuable natural resources. This in turn has caused financial losses and innumerable legal difficulties. A knowledge of the ground water hydrology with an established ground water code in Montana would protect the interests of those who have already developed ground water supplies as well as protect those who may drill wells in the future.

METHOD OF SURVEY

Water Resources data contained in Part I and Part II of this report are obtained from courthouse records in conjunction with individual contacts of land-ownership. A survey of this type involves extensive detailed work in both the office and field to compile a comprehensive inventory of water rights as they apply to land and other uses.

The material of foremost importance used in conducting the survey is as follows: From the files of the county courthouse the data required includes: land-ownership, water right records (decrees and appropriations), articles of incorporations of ditch companies and any other legal papers in regard to the distribution and use of water. Deed records of land-ownership are reviewed and abstracts are checked for water right information when available.

Another important part of the survey is complete aerial photo coverage of each county in order to map accurately the land areas of water use. On the aerial photographs, section and township corner locations are determined by the photogrammetric system, based on Government Land Office survey plats, plane-table surveys, county maps and by "on the spot" location during the field survey. Shown on the aerial photograph is all the information pertaining to the location of the irrigation system with irrigated and potentially irrigable land areas under private and incorporated ditches distinguished by different colors.

Field forms are prepared for each landowner, showing the name of the owner and operator, photo index number, a plat defining the ownership boundary, type of irrigation system, source of water supply, and the total acreage irrigated and irrigable under each. All of the appropriated and decreed water rights that apply to each ownership by the description of intended place of use are listed on the field form. During the field survey, all water rights listed on the field form are verified with the landowner. Whenever any doubt or complication exists in the use of a water right, deed records of the land are checked to determine the absolute right of use.

So far as known, this is the first survey of its kind ever attempted in the United States. The value of the work has become well substantiated in the counties completed to date by giving Montana its first accurate and verified information concerning its water rights and their use. New development of land for irrigation purposes by State and Federal agencies is not within the scope of this report. The facts presented are as found at the time of completing each survey and provide the items and figures from which a detailed analysis of water and land use can be made.

The historical data contained in these reports can never become obsolete. If new information is added from time to time as new developments occur, the records can always be kept current and up-to-date.

HISTORY AND ORGANIZATION

The Lewis and Clark Expedition in 1805, working its way up the Missouri River, was made up of the first white men of record to explore the region that is now Lewis and Clark County.

On the 18th of July, 1805, Captain Lewis and his party passed south of the Dearborn River, which he named for the Secretary of War. The next day, on July 19, Meriwether Lewis and party made their way through the gorge that the Missouri had cut through the Big Belt Mountains and they named it "The Gates of the Mountains." The same day that Lewis was passing through the gorge of the Missouri, Captain William Clark crossed over into a nearby valley containing an extensive growth of Prickly Pear. So abundant was this growth, that Captain Clark was forced to halt and remove seventeen of the agonizing spines from his feet and that is the reason the valley and the creek that runs through it were named "Prickly Pear."

On his return journey from the Pacific Coast in 1806, Captain Lewis crossed the Continental Divide through what is now known as the Lewis and Clark Pass, at the head of the North Fork of the Dearborn River and traversed the northern part of Lewis and Clark County, sixty miles northwest of Helena in the vicinity of the present town of Augusta.

Neither Lewis nor Clark ever recorded seeing any permanent Indian camps in the area. They did, however, record that game animals were decidedly plentiful. It is therefore believed that the area was never occupied as a regular place of abode by any of the Montana Indian tribes, although it was occasionally visited by the hunting parties of different tribes as indicated by the finding of such Indian relics as stone arrowheads, skinning knives and cutting tools. Throughout the area many of the valleys were infested with rattlesnakes, which was perhaps the main reason why the Indian did not make it his permanent headquarters.

History does not record any additional exploration of this region by white men between 1806 and 1853, but indications are that traders and trappers were in the area at irregular intervals.

In 1853, Lieutenant John Mullan of the U. S. Army, surveyed the route for a wagon road which passed through the Little Prickly Pear Valley and extended on to the foot of the next dividing ridge, which is now called Mullan Pass. The Northern Pacific Railway follows this route, crossing the Continental Divide by means of the Mullan Tunnel.

In January, 1854, Lieutenant Grover of the United States Army, with a party of five men and dog train, made passage from Ft. Benton on the Missouri River to the Bitterroot Mountains by way of Lewis and Clark Pass at the head of the Dearborn River. In going over this pass they encountered cold weather as intense as thirty-six degrees below zero. Again in March, 1854, Lieutenant Grover, starting from Ft. Benton with a loaded wagon hitched to four mules, followed a level prairie road to the valley of Little Prickly Pear and found it an easy road for wagon. He crossed the Continental Divide at Mullan Pass and said "indeed the ascent and descent were so exceedingly gradual that it was not necessary to lock the wheels of the wagon in descending, but it was driven with the animals trotting."

It was in 1858 that Lieutenant Mullan began construction of the military wagon road from Ft. Benton to The Dalles, Oregon, along the general route of the survey he had made in 1853. By 1860, the road was ready for use through the Helena region and in 1862 the entire 624 miles of the wagon route was completed. The road passed through Wolf Creek Canyon, forty miles north of Helena and ascended

the Little Prickly Pear Valley, crossing the Continental Divide at Mullan Pass. Many road houses and stage stations were built along this well traveled route during the next ten years.

In the fall of 1862, an immigrant wagon train following the Mullan Road, stopped near what was then known as the Three Mile House, not far from the present railroad station of Silver on the Great Northern Railway and a distance of about fourteen miles north of the present site of Helena. After some discussion and looking around, the immigrants decided to settle in the Little Prickly Pear Valley and accordingly they constructed houses there for the winter. These people were the first white settlers in the area.

Prospectors as early as 1862, making their way north must have passed directly over the present site of Helena. They continued on north about 18 miles to Silver Creek where fair placer ground was discovered and soon the busy mining community of Silver City sprang up there. Silver City's importance was increased by the establishment of a stage stop for stage and freight lines operating between Ft. Benton and Virginia City. Quartz mines containing silver and gold were open near Silver City and this added to the population and importance of the community. At the time gold was discovered in Last Chance Gulch, Silver City, except for Virginia City and Ft. Benton, was the most important town in the Montana Territory.

In 1863, while western Montana was still a part of the Idaho Territory, L. C. Miller, who represented Bannack in the Idaho Legislature, succeeded in obtaining the passage of a bill establishing the counties and boundaries in western Montana for the first time. With the exception of Lewis and Clark County, at that time a part of Jefferson County, the same boundaries fixed by Mr. Miller's bill were confirmed and re-established by Montana's First Territorial Legislature at Bannack. In May, 1864, after a connection of a little more than a year with Idaho, Montana was created as a separate territory and Sidney Edgerton, at the time Chief Justice of Idaho, was made governor. Included in Montana's nine original counties was Edgerton County, named for Montana's first Territorial Governor. By an act approved by the Legislature on December 20, 1867, the name of Edgerton County was changed to Lewis and Clark, the change to become effective as of March 1, 1868. Four years later, on March 12, 1872, the boundaries of Lewis and Clark County were permanently defined by an act of the Legislature and only four minor changes have occurred since that date.

Helena owes its existence to placer gold discoveries made in Last Chance Gulch, which is now Helena's main business district. Gold was first discovered there in July, 1864, by a party of prospectors consisting of John Cowan, Robert Stanley and Gabe Johnson. These men found some good colors panning the sands and gravels of the gulch, but were not quite satisfied with their discovery and left to try their luck farther north. Finding conditions unfavorable in the north they returned to the gulch late in the fall, agreeing among themselves that it was their "last chance" for that season; hence the name "Last Chance," which they gave to the gulch. After more extensive exploration and prospecting the men found that the gulch was fabulously rich in placer gold. News of the gold strike spread rapidly and in a few weeks a tent and log cabin city sprang up around the diggings.

It was a public meeting held in Captain Wood's cabin October 30, 1864, (the minutes of which are still preserved) that the name of Helena was selected on a motion and suggestion of Mr. John Somerville. At the meeting, Somerville announced that Helena (Hel-e-na, with the accent on the second syllable) was the best town in Minnesota and that the thriving mining camp must be named after the Minnesota town. However, the miners did not like the way Somerville pronounced the name and

changed it so the accent is on the first syllable with all the e's short which is the pronunciation of Helena, Montana, today.

As a result of action by the Territorial Legislature and an election, Helena became the capitol of the territory in 1875. Virginia City made a strenuous campaign to retain the capitol, but Helena was now the largest town in the Territory and the general election was heavily in favor of Helena.

When Montana became a state September 8, 1889, Helena became the temporary state capitol until an election could be held in 1892. Almost every town in the state entered the contest, but Helena emerged the victor. This election did not satisfy the town of Anaconda, the runner-up in 1892, and in 1894 a second election was held to decide the matter again. Helena was sponsored by W. A. Clark, wealthy banker and mining operator, who later became a U. S. Senator from Montana. Anaconda had the support of Marcus Daly, who founded the City of Anaconda and the Anaconda Copper Mining Company. The election was bitterly contested, but when the votes were counted it was found that Helena had won by nearly a 1,000 vote majority. The bitter contests over the location of the capitol were caused by the intense rivalry between Clark and Daly, both of whom were engaged in developing the mines at Butte and who were striving for supremacy in politics as well as in mining. Daly was more popular in Butte and Anaconda, but in other sections of the state Clark had more influence.

Helena's growth during the 1870's was accelerated by other rich mining discoveries nearby. In those years gold and silver mines were opened at Rimini, to the southwest; at Marysville, to the west; and in the Gould-Stemple District, forty miles northwest. Across the Missouri River such placer gulches as Confederate, Whites, Avalanche, Hellgate, Magpie, Cave, Oregon and York, yielded gold estimated at $30,000,000. Prospectors and capitalists of Helena discovered and developed rich silver and lead deposits at Wickes, Corbin and Elkhorn in Jefferson County. Also sponsored by Helena's capitalists was the smelter at Wickes, where the mines of that section yielded $50,000,000 before 1892. When the East Helena smelter was built in 1888, the plant at Wickes lost favor and in 1892 was purchased by the American Smelting and Refining Company, dismantled and moved to East Helena.

A great mining center, Helena, in the early 1890's was said to be the richest city per capita in the United States, numbering among its residents fifty millionaires. The people were flush with the profits from the mines and soon there began an orgy of ornate residential building. One result of their splurge is seen in Helena's west side residential district and in the suburbs known as Lennox and Kenwood.

With the slump in the price of silver in 1893, it looked as though Helena would be nothing more than the capitol of Montana. Many people who had built elaborate homes moved away and pessimistically predicted that the town was doomed. The prediction was that within one years time you could buy the best building in town for one hundred dollars. Many of Helena's millionaires who had invested their money in the city became disgusted and departed. What these people did not know was that stock raising, sheep raising, wheat growing and various industrial enterprises would supplement the loss of the mining boom.

Agriculture today is the most stable industry in the county and its development began simultaneously with the first discovery of gold. Many of the immigrants who came to Montana in the early 60's found that there were no more mining claims to be had and as a second choice decided to turn to farming and stock raising.

The pioneers of farming and livestock operations in Lewis and Clark County are far too numerous to mention all of them in this brief historical summary. Each of them in his way helped contribute to the early agricultural development in the area.

Among the first settlers in the county who engaged in farming and ranching were A. B. Morgan, Malcolm Clark and Edward Lewis. According to Captain Fisk in his diary of September 15, 1863, the Morgan ranch was the only settlement encountered as the Fisk wagon train passed through the valley of Little Prickly Pear. This ranch was perhaps the first in the county and consisted of a large log house, stalls for the horses and a corral for the livestock. The ranch buildings were surrounded by a wooden stockade, ten feet high, which covered a considerable area. Morgan supplied vegetables, grain, horses and cattle to the immigrants and wagon trains traveling through the country over the Mullan Road. With the increasing travel over the road he undoubtedly did a large business.

Malcolm Clark, an early-comer to the territory, lived near the mouth of Little Prickly Pear Canyon. Clark, a graduate of West Point, through some trouble resulting from horse stealing by the Indians, was murdered by these same Indians at his ranch home on the night of August 23, 1869. They also shot his son Horace through the face and left him on the ground for dead, but he recovered. The Indians intended to carry off Clark's wife and three daughters, but they were too busily engaged in securing 30 to 50 head of horses to do it that night. Major Clark had lived among the Blackfeet and had married into their tribe which made his murder by these Indians remarkable, since he had spent a fortune in administering to their wants as their friend and counselor. He was personally known to nearly every settler of Montana and had displayed hospitality with a liberal hand to many weary immigrants who were not of means, on their way from the states to the rich gold fields of the territory. He was buried near his home, on a knoll overlooking the valley and his grave was later visited by a classmate, General Sherman, when he came west on a military mission. The Montana Pioneer's Historical Society have preserved the burial ground of Malcolm Clark and family as a State Historical Cemetery.

Edward A. Lewis also settled in the Little Prickly Pear Valley and was a close friend and neighbor to Malcolm Clark. In the spring of 1866, Malcolm Clark and Edward Lewis sold their charter for a toll road through Little Prickly Pear Canyon to Warren C. Gillette and James King. The road cost forty thousand dollars when completed and was ready for travel to Ft. Benton before the end of that season. Although the tolls were high, it took Gillette and King about two years to get back their original investment.

Some of the other prominent men who played an important role in the agricultural development of the county during the period 1864-1880 were: William Reed, Gilbert Benedict, Joseph Cobell, Frank Garnish, Paul Vermet, Harvey English, John Jones, Robert S. and Clark Tingley, John Merry, Elizur Beach, Dr. W. L. Steele, D. A. G. Floweree, Albert G. (China) Clarke, W. R. McComas, Wallace L. Millegan, Sam Ford, Akin W. Kingsbury, Thomas Benton Persell, Lazare "Curley" Eroux, Hugh Kirkendall, James Fergus, Frank Powers, Charles M. (Three Mile Charley) Wirth, Joseph Sargent, William Kemp Roberts, Ben Toole, Herman Gans, Lewis Gans, Henry Klein, Calvin Beach, D. J. Hogan and Con Kohrs, to name a few. Most of the original settlers were of English, Irish, Scotch and German descent. Descendants of these pioneer families still account for a large percentage of the present population in Lewis and Clark County.

Helena, the state capitol of Montana, is the most important town in Lewis and Clark County and has survived as a semi-industrial and agricultural community. Political and commercial developments

grew in spite of the predictions of doom. As a governmental center for Federal, State and County agencies, Helena can support its present population and will continue to grow if the natural resources of the region receive more intensive development. Helena today is no longer a mining camp but a typical American city.

Other towns of importance within the boundaries of Lewis and Clark County are: East Helena, Augusta, Wolf Creek, Lincoln and Marysville.

East Helena is the largest town outside of Helena in the county and has the American Smelting and Refining Company located there. Augusta, located in the northern part of the county, is a typical rural community and owes its existance to the farm and ranch operations in the area nearby. Wolf Creek at the junction of State Highway 33 and U. S. 91 is a small rural community and derives most of its trade from tourists, traveling north and south from Helena, Great Falls and Glacier Park. Lincoln, a small community in the western part of the county on State Highway 20, has some lumber industry, with several sawmills located there. It is also a favorite recreational area for local people and out of the state tourists, having summer home sites, outdoor sportsmen's activities and scenic attractions. Once a thriving mining town, Marysville, about twenty miles northwest of Helena, still has a few mines which operate intermittently.

Lewis and Clark County, located in the west central part of Montana had a population in 1950 of 24,540 and covers an area of 3,477 square miles.

This brief history of Lewis and Clark County is merely a summary of the most important recorded events. In every county, from the early days of pioneer settlement down to the present industrial and cultural development, there are certain high lights in its growth and life. Lewis and Clark County is no exception to the rule. Its growth has been both stormy and calm. The county has passed through periods of prosperity and depression until finally reaching its present stature with the steady development of industry and agriculture.

TRANSPORTATION

Transportation facilities in Lewis and Clark County are much better than those that are found in most other counties in Montana. From Helena sixty-five percent of the population can be reached at the lowest cost distributing rate. The markets of the larger cities of Butte, Great Falls, Anaconda, Missoula, Bozeman, Deer Lodge, and Livingston are all within a 125-mile radius.

The main highways that serve the county are: U. S. Highway 10N., which enters the county from the southeast at Clasoil or Louisville, continues in a westerly direction through Helena and leaves the county at McDonald Pass. U. S. Highway 91 enters the county two miles southeast of Helena and follows a northerly direction to Wolf Creek and Great Falls.

At Wolf Creek, State Highway 33 starts from U. S. Highway 91 and continues north to Augusta, connecting with U. S. Highway 89 at Choteau in Teton County. This highway has considerable travel as a short-cut route from Helena to Glacier National Park. Beginning at the junction with U. S. Highway 89, eight miles west of Vaughn, State Highway 20 crosses Lewis and Clark County in a southwesterly direction to the community of Lincoln and connects with U. S. Highway 10 at Bonner, in Mis-

soula County. West of Lincoln this route is still under construction for a distance of about 25 miles. From the junction at Simms in Cascade County, State Highway 21 branches off from State Highway 20 and follows a direct route west to Augusta where it connects with State Highway 33. All of the Federal and State Highways are maintained by the Montana State Highway Department which have their headquarters in Helena.

The county is well supplied with improved gravel roads to the outlying rural and recreational areas. There are two paved roads maintained by the county which should be mentioned. One starts from U. S. 91 about a mile north of Helena and follows a northeast direction for seven miles to the vicinity south of Lake Helena. The other paved county road leaves U. S. 91 ten miles north of Helena and extends to the rural community of Canyon Creek.

Both the Great Northern and Northern Pacific Railways serve Lewis and Clark County. Entering the county from the northeast, a branch line of the Great Northern Railway between Great Falls and Butte passes through Helena. Another spur line of this railway leaves Great Falls and enters the county along the northeast boundary and courses westerly to the town of Augusta. The main line of the Northern Pacific Railway crosses the extreme southern part of Lewis and Clark County, connecting Helena with all points east and west.

The Northwest and Western Airlines afford travel facilities by air in all directions from the city of Helena. The Northland Greyhound, Intermountain, and Canyon Bus Lines and many national trucking firms serve the area.

CLIMATE

Extending from Latitude 46° 23′ south of Unionville northward to 47° 59′ at headwaters of the North Fork of the Sun River, and having the Continental Divide either within its boundaries or along the western edge throughout the entire length, it is not surprising that topography plays a large part in the pattern of the climate of Lewis and Clark County. The Missouri River runs through rugged hills in the southeastern part of the county, and the Sun River forms much of the northern boundary. Much of Canyon Ferry Reservoir lies within the southeast corner. The county is one of the most mountainous in Montana, containing fairly large valley areas only around Helena, along the Sun River in the Augusta area, below Holter Dam to the Cascade County line, and to a lesser extent on the Blackfoot River near Lincoln. The latter area, incidentally, lies west of the Continental Divide. Differences in climate within the county are fairly large, as should be expected from the topography and from the distance (almost 100 miles airline) between southern and northern extremities.

There have been several stations where records have been kept of temperature and/or precipitation during recent years, and fairly long records are on file for Helena, East Helena, Canyon Ferry, Helena 6 NNW, Canyon Creek, Holter Dam, Gibson Dam, and Augusta. Records are available for shorter periods for Austin 1W, Unionville, Rogers Pass, Lincoln, and Lincoln 14 NE. These records give a fair sampling of county climate, except that the more mountainous areas are represented only by the very short periods of record from Unionville, Austin 1W, and Rogers Pass, and by the fairly long record at Gibson Dam. All these records are available through the U. S. Weather Bureau State Climatologist in Helena.

The county's climate, while following to some degree the pattern of other Montana counties on the east slopes of the Continental Divide, varies widely from the warmer lower elevations along the Missouri River below Holter Dam to the colder higher elevations on the headwaters of such streams as the Sun River, Blackfoot River, and Ten Mile and Prickly Pear Creeks. Precipitation also varies widely from the semi-arid totals measured in some parts of the Helena and Canyon Creek areas to fairly large amounts at higher elevations. Along with these basic variations, wind conditions very often differ greatly from the Sun River area to the more sheltered valleys around Helena, particularly during the winter. When winter "chinooks" start to blow along the Sun River, warming can be sudden and amount to as much as 50°F. in a few hours. Usually, however, these warm winds do not penetrate the cold air layer in the Helena Valley for several hours, or even days, and sometimes the "chinook" will not reach the valley floors in the southern third of the county.

Although the usual seasonal precipitation pattern is similar to that of much of the eastern slope area of Montana, there are important differences in the higher elevations along the Continental Divide. While the valleys receive normally from two-thirds to three-fourths of their annual precipitation during the growing season, with definite seasonal peaks in May and June, and again in September, the mountain areas and the Blackfoot Valley have another important peak during the winter months. This winter high elevation precipitation peak coincides with the normal accumulation of mountain snowpacks which show up each April-June period in increased stream flow. In the valleys the winter months normally are quite dry—the annual snowfall average for Helena 6N is only 24.8 inches a year. In the mountain areas, however, snowfall is usually quite heavy—254 inches fell during 1955 at Rogers Pass.

Most of the year's cloudy weather over the valleys occurs with the spring rains, but in the mountain sections cloudy weather is the rule from late fall well into the following summer. Steady type rains or snows don't occur very frequently over the valleys, but when they do they are associated with wintertime cold waves (snow) or with the rainy May-June season. Most summer precipitation over the valleys falls in showers. High relative humidities rarely are observed, and when they do occur they are observed with temperature well below the oppressive range. Severe storms seldom occur, but the "chinook" westerlies or southwesterlies sometimes become very strong (infrequently of hurricane strength) along the Sun River slopes. Hail sometimes causes some crop damage locally during the growing season, and lightning strikes occasionally damage power installations. There is no record of tornado damage in the county, and the very few funnel clouds reported over the years have been observed in open country.

Length of the average freeze-free season varies widely—from 139 days at Holter Dam and 134 days at Helena to 104 days at Augusta and 87 days at Gibson Dam. During almost all winter seasons there are a few invasions of cold air from the north during which temperatures usually fall to zero or below. The below zero cold usually lasts only for a few days, but in a few years at least one of these cold spells has lasted a week or more. Snow and blowing snow sometimes accompany these cold waves, mostly in the northern parts of the county. On the other hand, the cold waves usually "break" first in these same northern areas.

The following list contains a condensed summary of some of the county's older weather records:

STATIONS	YEARS OF RECORD	AVERAGE ANNUAL TEMPERATURE	HIGHEST	LOWEST	AVERAGE ANNUAL PRECIPITATION	WETTEST YEAR	DRIEST YEAR
Augusta	55	43.2*	103	-51	13.59*	24.00 (1927)	7.07 (1931)
Canyon Cr.	12	—	—	—	10.93	13.97 (1948)	7.79 (1949)
Cyn. Ferry‡	51	43.7	104	-41	11.40	17.43 (1947)	6.01 (1919)
East Helena	24	43.7	105	-45	9.82	15.06 (1947)	4.98 (1935)
Gibson Dam	44	41.8*	106	-49	16.88*	29.40 (1916)	9.19 (1935)
Helena	77	43.0**	103	-42	11.30**	20.04 (1881)	6.28 (1935)
Helena 6N	33	—	—	—	9.80*	14.86 (1948)	3.75 (1935)
Holter Dam	52	47.8*	108	-44	12.73*	24.80 (1916)	4.54 (1919)

‡Old Montana Power site 1900-1950 inclusive.

*Average for 1931-1952 inclusive.

**Average for 1921-1950 inclusive.

Extremes and averages for other periods than indicated by ** or * are for entire period of record indicated in the first column.

Coldest of record in the county was -69.7°, January 20, 1954 at Rogers Pass, a national record low.

Warmest of record in the county was 108°, July 30, 1936 at Holter Dam.

SOILS

The kinds of soils in an area tend to vary with climate, native vegetation, topography, geology and the length of time during which soil formation has occurred. Considering the wide variations of these factors in Lewis and Clark County, it is not surprising that a wide variety of soils exists. L. F. Gieseker in Montana Agricultural Experiment Station Bulletin 445, "Soils of Lewis and Clark County," Soil Reconnaissance of Montana, groups the soils into 46 mapping units. Each mapping unit represents a distinctive soil landscape. Most are complexes of several soil types. The characteristics and suitabilities for agricultural use of each mapping unit are described in the bulletin.

More than 70 percent of the county is mountainous. The remainder may be described physiographically as foothills and intermountain basins.

The foothills section extends along the eastern front of the mountains from Wolf Creek to Augusta and northward. Between Wolf Creek and the Dearborn River, the topography consists of smooth, stony slopes, low ridges, basins, and narrow entrenched stream valleys with steep sides. Between the Dearborn River and its South Fork, it is dominated by rather barren shale outcrops. To the north, the foothills area consists of high, broken sandstone and shale ridges which are capped with glacial drift. The relief of several townships south of Riebeling, where the bedrock is soft shales, is more subdued. Tablelands and benches of varying age and elevations occur along the major streams, particularly in the vicinity of Augusta. The principal soils are loams and clay-loams of varying depths. Many areas are stony. They grade from Chernozems (black grassland soils) adjacent to the mountains through Chestnuts (dark brown soils) to Brown soils at the lower elevations.

The principal intermountain basin occurs in the vicinity of Helena. Smaller basins are scattered northwestward through the mountains. The terrain of these basins is generally smooth and gently to strongly sloping with broken slopes along the entrenched drainage courses. The soils are developed in unconsolidated, more or less gravelly silts, sand and clays deposited in previous ages by water and wind The normally developed soils belong to the Chestnut and Brown great soils groups. Some saline and imperfectly to poorly drained soils occur near the streams and in the lower parts of the basins.

CROPS AND LIVESTOCK

Lewis and Clark County has a land area of 2,225,280 acres of which about half is in farms and ranches, and the remainder is largely mountainous, mostly in National Forests. The Bureau of Land Management and the Department of National Defense also have control over some acreages in the county. According to the 1955 Census of Agriculture, there are 382 farms and ranches in the county. Of these, 297 are classed as commercial farms.

Lewis and Clark is predominately a range livestock county with over 70% of the land in range. Beef cattle are the major source of agricultural income and most of the farms have some cattle. Ranchers reported receiving nearly $2,000,000 from cattle sales in 1954.

The number of sheep ranches has decreased for several years, but from the previous census in 1950 the number of farms reporting sheep were 43 and 68 farms in 1954. There are over 30,000 head of sheep in the county controlled by six large sheep ranchers, the rest are in farm flock operations. About one-third of the farmers have some hogs, but they are not considered as a major livestock enterprise. One packing plant, the Montana Meat Company, is located in the Helena Valley. Dairying is centered in the Helena Valley, although there are several dairy farms in the Wolf Creek-Craig area.

There are approximately 38,000 acres of irrigated land in the county. Most of the irrigated acreage is used for the production of hay, small grains, pasture, potatoes, and a few sugar beets.

Both winter wheat and spring wheat are produced, with spring wheat predominating. About 15,000 acres of wheat are grown each year. Oats and barley are also produced. Crops used for hay include small grains, wild hay, alfalfa, clover, and mixed hays. Except for wheat most of these crops are used locally. Potatoes are grown in the Helena Valley for the consumers market, with more than 50,000 hundred-pound bags sold each year during the past few years. Vegetables and some fruits are grown on many farms and ranches for home use.

The State Nursery and Seed Company located in Helena, has been in business since 1890 and its nursery and greenhouse products are sold throughout Montana. The Knox Flower shop also does some shipping outside of Helena. There are numerous small greenhouses scattered throughout the county catering mostly to local trade.

Sawlogs and fence posts are the main products from the farm forest land in the county. This harvest from the forest lands has become increasingly important during the last few years.

SOURCES OF WATER SUPPLY

The Continental Divide crossing the western part of Lewis and Clark County, separates the county into two major river basins; the Missouri and the Columbia. The Missouri River Basin being by far the larger of the two in the county.

Missouri River Basin

The east slope of the Continental Divide in Lewis and Clark County drains into the Missouri River by the means of four minor stream basins: Prickly Pear Creek on the south; Little Prickly Pear in the south central; the Dearborn River in the north central; and the Sun River along the northern boundary. On the eastern side of the Missouri River the drainage starts from the western slope of the Big Belt Mountains. This is of minor consideration, since only a few small streams drain from this area into the Missouri.

Including the Missouri River, the tributaries of principal irrigation importance are the following creeks: Magpie, Spokane, Trout, Prickly Pear, Ten Mile, Seven Mile, Silver, Three Mile, Beaver, Little Prickly Pear, Canyon, Rock, Dearborn River, Flat Creek, Sun River, Willow Creek, South Fork of Sun River, Elk, Smith, and Ford Creeks.

About 4,500 acres in the Helena Valley are irrigated from the Missouri River (Lake Helena) by pumping to two separate ditch systems operated by the State Water Conservation Board as the Lakeside and Helena Valley Water Users' Associations. This same area is included under the Helena Valley Irrigation District now under construction by the Bureau of Reclamation. Additional acreage in Helena Valley is also included in the new irrigation district.

From Ford and Smith Creeks on the Sun River drainage, the State Water Conservation Board operates another irrigation system of 750 acres under the name of the Nilan Water Users' Association.

From the Dearborn River, the Dearborn Canal and Water Company supplies water for the irrigation of about 2,400 acres.

Columbia River Basin

Montana west of the Continental Divide drains into the Columbia River through the Clark Fork and Kootenai Rivers. That portion of Lewis and Clark County in the Columbia River Basin drains into the Blackfoot River and its tributaries, which joins the Clark Fork at Bonner, in Missoula County. Before the United States Board of Geographic Names designated "Clark Fork River" as extending from Butte to Pend Oreille Lake in Idaho, the stream was locally known as Silver Bow Creek, then Deer Lodge River to Garrison, then Hell Gate River to Bonner where it became Missoula River to the confluence of Bitter Root River, thence Clark Fork River.

Tributary streams of irrigation importance in Lewis and Clark County that drain into the Columbia River are: the Blackfoot River, Poor Man's, Keep Cool, Beaver, and Willow Creeks.

STREAM GAGING STATIONS

The U. S. Geological Survey carries on the work of measuring stream flows, cooperating with funds supplied by the state and several federal agencies. The results are published yearly in book form, the last publication being for the year 1955. Later data may be obtained in advance form from the U. S. G. S. office. That ageny's records and reports have been used in the preparation of this resume.

Data given below covers all of the stream gaging which has been done in Lewis & Clark County from the beginning of measurements through the water year 1956. The water year begins October 1 and ends September 30 of the following year. Storage reservoirs that regulate stream flows at some of the stations are Lima Reservoir (built 1902), Ruby Reservoir (1938), Willow Creek (1937), Hebgen (1915), Madison, Ennis Lake (1900), Whitetail (1921), Lake Sewell (1898), Hauser Dam (1907), and Holter Dam (1918).

Where diversions for irrigation above the gage are shown, the acreages have been estimated by the Geological Survey and will not necessarily agree with the final results of the Water Resources Survey.

For convenience of the layman, the gaging stations have been grouped by drainage basins rather than taking them in order, beginning with headwaters and progressing downstream as was done in the U. S. G. S. published reports prior to 1951.

Following are equivalents useful in converting from one unit of measurement to another:

(a) In Montana, one cubic foot per second equals 40 miner's inches.
(b) One acre foot is the amount of water required to cover an acre one foot deep.
(c) One cubic foot per second will nearly equal two acre feet (1.983) in 24 hours.
(d) A flow of 100 miner's inches will equal five acre feet in 24 hours.
(e) One miner's inch flowing continuously for 30 days will cover one acre 1½ feet deep.

MISSOURI RIVER, MAIN STEM

Missouri River at Canyon Ferry

The gage is located at old Canyon Ferry Dam ½-mile downstream from Magpie Creek. The drainage area is approximately 15,700 square miles. Records are available for only three months, September through November, 1889. The gage was manually operated. The maximum discharge observed was 2,834 cfs (November 21) and the minimum observed, 1,693 cfs (September 1). There were many diversions for irrigation above the gage.

Missouri River Below Hauser Dam

The gage was located ¼-mile below Hauser Lake Power Plant. The drainage area is approximately 16,600 square miles. Records are available from October, 1922, through September, 1942. A water stage recorder was used. The average discharge for the 20 years was 4,115 cfs. The maximum daily discharge was 33,300 cfs (June 15, 18, 1927), and the minimum daily, 280 cfs (March 3, 1938). The highest annual runoff was 4,652,000 acre feet (1928); the lowest was 1,723,000 (1934); and the aver-

age, 2,979,000 acre feet per year. There are many diversions above the gage and the flow is regulated by several reservoirs and power plants. Much of the above information was furnished by the Montana Power Company.

Missouri River Below Holter Dam*

The gage is located ¼-mile below Holter Dam and 3 miles southeast of Wolf Creek. The drainage area is approximately 16,900 square miles. Records are available from October, 1945, to the present time. A water stage recorder is used. The average discharge for the 11 years (1945-1956) was 5,212 cfs. The maximum was 34,800 cfs (June 8, 1948) and the minimum daily, 830 cfs (May 22, 1955). The highest annual runoff was 5,653,000 acre feet (1948); the lowest was 2,262,000 (1954); and the average, 3,773,000 acre feet per year. There are diversions for irrigation of about 574,000 acres above the station and the flow is regulated by reservoirs and power plants.

Missouri River at Craig

The gage was located on the highway bridge at Craig. The drainage area is approximately 17,600 square miles. Records are available from October, 1889, through September, 1892. A staff gage was used. The maximum discharge observed was 28,650 cfs (June 11, 1892) and the minimum observed, 1,742 cfs (at times during October and December, 1890, and January, 1891). There were many diversions for irrigation above the gage.

PRICKLY PEAR CREEK BASIN

Prickly Pear Creek at East Helena

The gage was located at the Northern Pacific railroad bridge. The drainage area is 254 square miles. Records are available from July, 1908, through September, 1913. Some of the records were estimated from weather records and some taken from House Document 238, 73rd Congress, 2nd Session. A staff gage was used. The average discharge for the 5 years was 67.5 cfs. The maximum observed was 535 cfs (June 19, 1909) and the minimum was not determined. The highest annual runoff was 72,000 acre feet (1909); the lowest, 40,000 acre feet (1912); and the average, 48,870 acre feet per year.

Ten Mile Creek Near Rimini*

The gage is located at Moose Creek Ranger Station 500 feet upstream from Moose Creek and 3 miles north of Rimini. The drainage area is approximately 33 square miles. Records are available from October, 1914, to the present time. A water stage recorder and a Cippoletti weir are used. The average discharge for the 42 years (1914-1956) was 18.4 cfs and the maximum, 781 cfs (May 27, 1917). At times there was no flow. The flow is regulated by Chessman Reservoir (capacity, 1,750 acre feet) on a tributary above the gage. The highest annual runoff was 38,500 acre feet (1917); the lowest was 2,610 acre feet (1931); and the average, 13,320 acre feet per year. There is a small diversion above the station for the water supply of Helena.

Ten Mile Creek Near Helena

The gage was located opposite the old Broadwater Hotel. The drainage area is 102 square miles. Records are available from July, 1908, through September, 1954. Prior to September 18, 1925, a staff gage was used and to March 15, 1929, a water stage recorder at a site 100 feet downstream at a different datum. The later readings were made with a water stage recorder and concrete control. The average discharge for the 46 years (1908-54) was 27.2 cfs. The maximum was 995 cfs (May 28, 1917). There was no flow at times. The highest yearly flow was 53,300 acre feet (1927) and the lowest, 3,180 (1931), with an average of 19,690 acre feet per year. There were diversions for the irrigation of about 1,200 acres above the gage and for the water supply of Helena.

Seven Mile Creek at Birdseye

The gage is located at a private farm bridge at Birdseye 5½ miles upstream from the mouth and 7 miles northwest of Helena. The drainage area is approximately 32 square miles. Records are available from October, 1908, through September, 1913. A staff gage was used. Average discharge for the 5 years (1908-1913) was 7.60 cfs. The maximum was 76 cfs (June 9, 1909) and the minimum daily, 0.1 cfs (July 30, August 5, 10, 1910). The highest annual runoff was 7,770 acre feet (1909); the lowest was 3,140 (1911); and the average, 5,500 acre feet per year. The entire flow of the creek is appropriated for irrigation. There was some regulation by placer mining above the station.

Seven Mile Creek Near Helena

A few gage heights only were taken on Dr. Head's ranch.

LITTLE PRICKLY PEAR CREEK BASIN

Little Prickly Pear Creek Above Deadman Creek Near Marysville

The gage was located ¼-mile above Deadman Creek and 6½ miles northwest of Marysville. The drainage area is approximately 20 square miles. Records are available from May, 1909, through December, 1911. A staff gage was used. The maximum discharge observed was 86 cfs (May 27, 1909) and the minimum observed, 1.2 cfs (March 7-13, 1911). There were several diversions for irrigation above the gage.

Little Prickly Pear Creek Near Marysville

The gage was located ½-mile below Deadman Creek and 6 miles northwest of Marysville. The drainage area is approximately 44 square miles. Records are available from April, 1913, through December, 1932. The maximum discharge observed was 454 cfs (May 25, 26, 1917) and the minimum observed, 2 cfs (March 1-11, 1914). The average discharge for the 19 years (1913-1932) was 25.7 cfs. The highest yearly flow was 36,600 acre feet (1917); the lowest was 6,340 (1931); and the average was 18,610 acre feet per year. There are some diversions for irrigation above the gage.

Little Prickly Pear Near Canyon Creek Post Office

The gage was located ½-mile below Canyon Creek and 1 mile northeast of Canyon Creek Post Office. The drainage area is 183 square miles. Records are available from April, 1909, through December, 1924. A staff gage was used. The average discharge for 13 years (1909-1911, 1913-1924) was 48.2 cfs. The maximum flow observed was 665 cfs (May 29, 1913). At times there was no flow. The highest annual runoff was 69,900 acre feet (1917); the lowest was 9,090 (1919); and the average was 34,900 acre feet per year. The flow is greatly affected by irrigation diversion above the gage. The published records are known as "Near Marysville" 1909-11.

Lost Horse Creek Near Marysville

The gage was located at the Johnson ranch ¼-mile above Deadman Creek and 5½ miles west of Marysville. The drainage area is approximately 13 square miles. Records are available from April, 1909, through June, 1911. Winter records are missing. A staff gage was used. The maximum discharge observed was 42 cfs (June 13, 1909). There was no flow at times. There was one small diversion for irrigation above the gage.

Deadman Creek Near Marysville

The gage was located on the Johnson ranch ¼-mile above Lost Horse Creek and 6 miles west of Marysville. The drainage area is approximately 10 square miles. Records are available from April, 1909, through June, 1911. A staff gage was used. The maximum discharge observed was 132 cfs (May 28, 1909) and the minimum observed, 2.4 cfs (September 10, 1910). There are two small diversions for irrigation above the gage.

Marsh Creek Near Marysville

The gage was located at Hartmiller ranch 2½ miles above the mouth of the creek and 7 miles northwest of Marysville. The drainage area is approximately 6 square miles. Records are available from April, 1909, through December, 1911. A staff gage was used. The maximum discharge observed was 15 cfs (June 9-13, 1909); the minimum was as low as 1.3 cfs at various times but was not definitely determined. There was a small diversion for irrigation above the gage.

Canyon Creek Near Canyon Creek Post Office

The gage was located on the Van Cleve ranch 300 feet above Cottonwood Creek and 3 miles northwest of Canyon Creek Post Office. Records are available from May, 1921, through July, 1923. A wire weight gage was used. The drainage area is approximately 74 square miles. The maximum discharge observed was 268 cfs (May 20, 1922) and the minimum observed, 5.6 cfs (March 27,1922). There is one small diversion for irrigation above the gage.

Cottonwood Creek Near Canyon Creek Post Office

The gage was located on the Van Cleve ranch a few hundred feet above the mouth of the creek and 3 miles northwest of the Canyon Creek Post Office. A staff gage was used. The drainage area is approximately 17 square miles. Records are available from May, 1921, through September, 1922.

The maximum discharge observed was 14 cfs (March 22, 1922) and the minimum observed, 0.9 cfs (June 14 and September 1, 1921). There are no diversions or regulations above the gage.

DEARBORN RIVER BASIN

Dearborn River Above Falls Creek

The gage was located ½-mile above Falls Creek, 2½ miles southwest of Clemons Post Office and 16 miles south of Augusta. The drainage area is 69.6 square miles. Records are available from May, 1908, through December, 1911. A staff gage was used. The maximum discharge was estimated to be about 4,000 cfs (June 2, 1908) and the minimum observed was 13.7 cfs (anuary 17, 1911). There were no diversions above the gage.

Dearborn River Near Clemons

The gage was located 300 feet above the highway bridge, ½ mile southeast of Clemons Post Office and 2 miles below Falls Creek. The drainage area is 123 square miles. Records are available from April, 1921, through September, 1923, and May, 1929, through September, 1953. A wire weight gage was used prior to April 8, 1931, and then a water stage recorder thereafter. The average discharge for the 26 years of record was 116 cfs. The maximum observed was 2,970 cfs (June 4, 1948) and the minimum, 7.4 cfs (October 22 and 23, 1936). The highest annual runoff was 155,200 acre feet (1948); the lowest was 28,810 (1937); and the average, 83,980 acre feet per year.

Dearborn River Near Craig*

The gage is located at a bridge on Highway 33, 5 miles below the South Fork and 12 miles above the mouth of the river. The drainage area is 325 square miles. Records are available from October, 1945, up to the present time. A wire weight gage was used prior to October 1, 1946, and a water stage recorder has been used since then. The maximum discharge was 7,960 cfs (June 4, 1953) and the minimum observed, 12 cfs (August 2, 1956). The mean discharge for the 11 years (1945-1956) was 225 cfs. The highest yearly flow was 263,800 acre feet (1948); the lowest was 74,270 (1946); and the average, 162,900 acre feet per year.

Falls Creek Near Clemons

The gage was located 500 feet above the mouth of the creek, 1½ miles southwest of Clemons Post Office and 16 miles south of Augusta. The drainage area is approximately 38 square miles. A staff gage was used. Records are available from May, 1908, through December, 1911. The maximum discharge observed was 540 cfs (June 6, 1909). The minimum was not determined. There were no diversions above the station.

SUN RIVER BASIN

North Fork of the North Fork of Sun River Near Augusta*

The gage is located 400 feet above Medicine Creek and 1 mile above the confluence with the South Fork. The drainage area is 258 square miles. Records are available from May, 1911, through September, 1912, and from October, 1945, up to the present time. A water stage recorder is now used. Prior to July, 1946, a staff gage and wire weight gage were used. The maximum discharge was 4,840 cfs (June 3, 1948) and the minimum, 27 cfs (November 21, 1949). The mean annual flow for the 12 years (1911-12, 1945-56) was 369 cfs. Highest annual discharge was 324,000 acre feet (1954); lowest was 200,400 (1949); and the average was 267,100 acre feet per year. There are no regulations or diversions above the gage.

South Fork of the North Fork of Sun River Near Augusta

The gage was located 1 mile above the confluence with the North Fork and 24 miles northwest of Augusta. The drainage area is 252 square miles. A staff gage was used. Records are available from May, 1911, through September, 1912. The maximum discharge observed as 2,740 cfs (June 3, 1911). The minimum was not determined. There were no diversions or regulations above the gage.

North Fork of Sun River Near Augusta

The gage was located about 150 feet above the Diversion Dam and 18 miles northwest of Augusta. Records are available from August, 1889, through December, 1890, and July, 1904, through September, 1940. The drainage area is 609 square miles. A water stage recorder was used after September 30, 1936. The maximum discharge was 32,300 cfs (June 21, 1916) and the minimum, 3.4 cfs (April 18, 1938). The mean discharge for the 37 years (1889-90, 1904-40) was 820 cfs. The highest yearly runoff was 1,173,000 acre feet (1916); the lowest was 272,000 (1931); and the average, 593,-700 acre feet per year.

South Fork of Sun River at Augusta

The gage was located at the old highway bridge ½-mile from Augusta and 6 miles above the mouth of the river. A staff gage was used. The drainage area is 157 square miles. Records are available from October, 1904, through November, 1924. The maximum discharge observed was 4,300 cfs (June 2, 1908); there was no flow at times. The average annual discharge for the 20 years (1904-1924) was 94.4 cfs. The highest annual runoff was 154,000 acre feet (1917); the lowest was 14,800 (1919); and the average, 68,340 acre feet per year. There were diversions above the gage for irrigation of about 4,500 acres.

Willow Creek Near Augusta

The gage was located just below Little Willow Creek or 5 miles northwest of Augusta. The drainage area is approximately 96 square miles. Records are available from June, 1905, through September, 1925. Prior to August 22, 1905, a staff gage was used and thereafter a chain gage. The maximum discharge was 1,150 cfs (June 23, 1916). The minimum was no flow (July 17, 1910). The average annual discharge (1905-25) was 27.7 cfs. Highest yearly flow was 56,200 acre feet (1916); the lowest

was 5,190 (1919); and the average, 20,050 acre feet per year. There are diversions above the gage for the irrigation of about 2,000 acres.

Smith Creek Near Augusta

The gage was located 5 miles above Ford Creek or 13 miles southwest of Augusta. The drainage area is 25.0 square miles. A staff gage was used. Records are available from April, 1906, through December, 1912. The maximum discharge was 1,500 cfs (June 4, 1908) and the minimum observed, 6 cfs at times during 1906 and 1911. The mean annual discharge for the 6 years (1906-12) was 37.6 cfs. The highest annual runoff was 40,900 acre feet (1909); the lowest, 15,300 (1910); and the average 27,220 acre feet per year. There were no diversions or regulations above the gage.

Smith Creek Below Ford Creek Near Augusta

The gage is located 2 miles below Ford Creek or 4 miles above the mouth of Smith Creek. The drainage area is 74.0 square miles. A staff gage was used prior to July 9, 1946, and a water stage recorder thereafter. Records are available from October, 1945, through September, 1952. The maximum discharge was 1,830 cfs (June 5, 1948) and the minimum daily, 12 cfs (December 19-21, 1945). Average annual discharge for the 7 years was 65.7 cfs. Maximum annual runoff was 81,370 acre feet (1948), and the minimum, 20,760 (1946). Average runoff was 47,560 acre feet per year. There were diversions for the irrigation of about 1,000 acres above the station.

Ford Creek Near Augusta

The gage was located on Ford ranch 14 miles west of Augusta. The drainage area is 19.4 square miles. A staff gage was used. Records are available from April, 1906, through December, 1912. The maximum discharge was 1,230 cfs (June 19, 1909), and there was no flow on November 2-3, 1906. Average annual discharge for 6 years (1906-12) was 32.2 cfs. The highest annual runoff was 35,800 acre feet (1909); the lowest was 15,700 (1910); and the average was 23,310 acre feet per year. There was one diversion for irrigation above the station.

Crown Butte Canal at Riebeling

The gage was located at the railroad station of Riebeling ½-mile below the headgate and 11½ miles east of Augusta. The drainage area was not measured. Records are available for only 4 months (June through September) in 1912. A staff gage was used. The maximum daily discharge was 62.6 cfs (June 17) and the minimum daily, 3.4 cfs (September 16, 17, 21-26). This canal diverted from Sun River. There were no diversions between the headgate and the gage.

*These gaging stations are still being operated (1957).

RESERVOIRS

Details of the operation records since 1939-40 of the following reservoirs are available in the U. S. Geological Survey publications. All records prior to 1939 may not be available in the U. S. G. S. office but might be obtained from the reporting agency.

Lake Sewell

The old Canyon Ferry Dam, which created Lake Sewell, was built in 1898 and located 15 miles east of Helena. The reservoir had a usable capacity of 37,800 acre feet. The old dam was submerged by the new Canyon Ferry Dam on April 8, 1953. Records were furnished by the Montana Power Co.

Canyon Ferry Reservoir

A water stage recorder is located in the new powerhouse control room. The drainage area is approximately 15,860 square miles. Records are available from April, 1953, through September, 1956. Construction of the new Canyon Ferry dam began in 1949 and was completed in 1953. Storage began in the new reservoir in March, 1953. The old Canyon Ferry Dam was submerged on April 8, 1953. The maximum daily content during the period (1953-56) was 2,043,000 acre feet (July 15-29, 31, 1955 and July 2, 5, 6, 8, 1956). The total capacity of the reservoir at the controlled spillway elevation is 2,043,000 acre feet exclusive of 8,000 acre feet of dead storage. The minimum power operating elevation is 3,728 feet (reservoir contents 428,060 acre feet exclusive of dead storage).

Lake Helena

Lake Helena is separated from Hauser Lake by control works permitting independent regulation. It has a usable capacity of 10,400 acre feet. Records are available since April, 1945, furnished by the Montana Power Company.

Hauser Lake

The Hauser Dam, 13 miles northeast of Helena, was completed in 1907. The reservoir has a usable capacity of 52,100 acre feet. Records were furnished by the Montana Power Company.

Holter Lake

The Holter Dam, 26 miles north of Helena, was completed in 1918. The reservoir has a usable capacity of 81,900 acre feet. Records were furnished by the Montana Power Company.

Gibson Reservoir

Gibson Reservoir is located on Sun River 20 miles northwest of Augusta. The dam was completed in 1929. The reservoir has a usable capacity of 105,000 acre feet for irrigation (88,560 acre feet prior to 1941). Records were furnished by the Bureau of Reclamation.

Pishkun Reservoir (off-stream storage)

Water is diverted from Sun River 18 miles northwest of Augusta into the Pishkun Reservoir which was completed in 1925 for irrigation. The usable capacity is 32,050 acre feet. The records were furnished by the U. S. Bureau of Reclamation.

Willow Creek Reservoir on Willow Creek

This reservoir is located 5 miles northwest of Augusta. It was completed in 1911 and has a usable capacity of 32,300 acre feet for irrigation (16,700 acre feet prior to 1941). A supplemental supply to the reservoir is diverted from Sun River. Records were furnished by the Bureau of Reclamation.

Nilan Reservoir (off-stream storage)

Water is diverted from Smith and Ford Creeks about 10 miles southwest of Augusta. The reservoir was completed in 1951 for irrigation with a usable capacity of 10,090 acre feet. Records were furnished by the Montana Water Conservation Board.

MINING

Lewis and Clark County lies along the Rocky Mountain Front and except for a small section in the northeast portion of the county, is very mountainous. Metal mining is one of the chief industries in Lewis and Clark County. In 1956, the county produced gold, silver, copper, lead, and zinc valued at $1,477,735, second only to Silver Bow County in total value of metals mined. From 1940 through 1955, a period of sixteen years, the county produced well over $48,000,000 in recoverable metals. By 1956 the producing mines in the county consisted of thirteen lode claims and one placer. Other lode mines and placer claims have been intermittently mined increasing or decreasing the total number of mines worked during any one year.

Placer mining became prominent again after 1935. It ranks second to Madison County in the production of placer gold.

Sand and gravel mining has increased in recent years and the production of these commodities doubled during 1952. Clay mining for brick and terra-cotta continues to increase and granite riprap is quarried from the Wolf Creek quarry for the Great Northern Railway Company.

Coking coal is plentiful in and around Augusta, in the northern part of the county. There are several mines in this neighborhood.

Drilling for oil and gas within the county has been undertaken and several shows of gas have been reported. It is possible that with depth, the area may show more promise.

Austin (Greenhorn) District

Austin is on the Northern Pacific railroad, approximately 10 miles northwest of Helena. The mines within this district lie in the mountainous region surrounding the town. The placers of Seven Mile Creek have been worked for a distance of 12 miles and have yielded an estimated $1,200,000 in placer gold. Lode mines worked since 1880 have yielded over $300,000 in recoverable metals of gold, silver, copper, and lead. In the period from 1940 to 1955, production has diminished and the total value of recoverable metals mined has been valued at approximately $3,000. The district includes: The War Eagle, Blue Jay, Copper Hill, Osage Chief, King Tut, Baldy Smith, Parnell, Christiana, Benson-Pood, Ted Swan, Landon, and Scallon-Vinson mines.

The lodes are mainly irregular pockets or pipe-like bodies of different sizes found in limestone near the contact of quartz monzonite. The limestones and shales of the Belt Series, quartzite, shale, and limestone and Cambrian and Devonian age and the Madison limestone of early Mississippian age, were all intruded and metamorphosed by the quartz monzonite of the Boulder Batholith.

Gould-Stemple (Fool Hen, Poorman) District

This district lies along the Continental Divide, 30 miles northwest of Helena. The mines are distributed through an area of about 9 square miles that include the upper part of Gould and Virginia Creeks, and Granite Peak to the south. The principal mine in the district, the Jay Gould, has pro-

duced over $2,500,000 in gold since its discovery in 1884. Other mines that have produced include: The Hubbard, Prize, Homestake, Last Chance, Batchelor, Rover, Nakoma, Alpha and Omega. Although production has steadily waned in recent years the district produced slightly over $500,000 in the period from 1940 through 1953, in recoverable metals of gold, silver, copper, and lead.

Placers of Virginia Creek and its tributaries yielded approximately $600,000 in gold, whereas, the yields from Poorman and Canyon Creek placers were much smaller.

The district is underlain by pre-Cambrian Belt series of sedimentary rocks which have been intruded by granite. These sedimentary rocks consist chiefly of purple and greenish-grey shales or argillites. The ore bodies in the district are veins which consist chiefly of quartz and minor amounts of calcite. The veins average 3 to 4 feet in width, and are persistent along the strike and down the dip. The principal ore is gold ore with minor amounts of silver, copper, and lead.

Heddleston (Big Blackfoot, Silver) District

The Heddleston district is near the head of the Blackfoot River about 35 miles northwest of Helena. Although discovered in 1889, its development has been retarded until recent years when the Mike Horse Mine became one of the principal producers of lead and zinc ore in the state. Production from this mine began to increase in 1940 until in 1945, 1946, 1947, 1948, and 1949, the total value of recoverable metal neared the million dollar mark for each of these years. The mine was closed in 1952 and since then has produced some copper and lead ore on a lesser scale. Intermittent production within the past 15 years has come from the Carbonate, Rogers Pass claim, Mazuma, Consolation, Pass Creek, Mayou, and other mines. The total productivity in recoverable metals of gold, silver, lead, zinc, and copper for the periods from 1940 through 1952, has been valued at $11,195,822.

The ore deposits consist of filled breccia in which replacement has occurred and forms regular veins. They are several feet wide and persistent in strike and dip. The argillite, quartzites or sandstones of the pre-Cambrian Belt series sediments, have been intruded by a diorite sill, 500 feet thick.

Helena (Last Chance, Spring Hill, Unionville) District

The district includes the placer areas in and around Helena. It was discovered in 1864, and by 1928 had yielded over $16,000,000 in placer gold, and $6,304,000 from lode mines, chiefly from the Spring Hill and Whitlatch-Union mines. Placer mining was again revived after 1935, with the installation of two bucket-lift dredges. Lack of additional gravel to treat, forced the dredges to close down after 1950.

Intermittent production within the district since 1940 from lode properties, has come from the Sara Jane, Independent Property, Humboldt Claims, Spring Hill, Court House, Whitlatch, Peck Concentrator dump, Crescent and Franklin D., Copper Cliff, Victory mines and others. The total value in recoverable metals from this district of gold, silver, and minor amounts of lead, zinc, and copper, for the 15 year period from 1940 through 1954, is approximately $2,374,482.

The sedimentary rocks of limestone, shale, and sandstone of pre-Cambrian and early Palezoic age and their metamorphic equivalents are folded and faulted along the south and west and were intruded by the quartz monzonite of the Boulder Batholith, along with basic dikes and sheets which are very apparent throughout the district. The ore deposits occur chiefly along the contact zone and are characterized by contact metamorphic silicates, tourmaline, quartz, and pyrite.

Lincoln Area

The Lincoln area is 26 miles north of Avon and it is essentially a placer mining district. The area was discovered in the late 1860's and has yielded up to $14,000,000 in placer gold from Lincoln, Seven Up Pete, McClellan, Sauerkraut, and other gulches. Within the past fifteen years dredging and sluicing has been going on intermittently, on Abraham, Bluebird, Dollar, and Half Dollar placers, on Poor Man, McClellan, Park, Lincoln, and Sauerkraut gulches. The total production within this district from 1940 through 1954, of recoverable metals, is valued at $111,501. The more productive years were 1948, 1949, and 1951, when over $30,000 a year in placer gold were removed from Poor Man and McClellan Creeks.

Marysville-Bald Butte (Ottawa) District

Marysville is 18 miles northwest of Helena. The district was discovered in the 70's and since has produced over $31,000,000 in gold, silver, copper, lead, and zinc. The major production from this district is credited to the Drumlummon Mine. Other important producers are: The Bald Butte, Belmont, Cruse, Penobscot, Empire, Piegan-Gloster mines. Minor amounts of metal production came sporadically from the Eck, Shannon, Neenon, Shakopee, Towsley, Earthquake, Enterprise, Big Ox, Golden State, Trinity, and Nile dump. The total value in recoverable metals from 1940 to 1953 is estimated to be well over $2,300,000. Production from these mines declined rapidly in 1952 and 1953, and at the present time, the Drumlummon is far below its former rate of production.

The ore deposits occur along the margins of the Marysville Batholith, a quartz diorite intrusive into pre-Cambrian Belt series sediments. The ore minerals are found in both sedimentary and igneous rocks. Three vein systems are recognized. The ore occurs in fissure veins filled with quartz containing gold and sulfides and sulpho-antimonides of silver. Partly replaced wall rock is often included in mining.

Rimini (Vaughn) District

The Rimini district is on Ten Mile Creek 14 miles southwest of Helena. The district was discovered in 1870, however, the most productive period was from 1885 to 1900. Within the last fifteen years production has come from the Bunker Hill, Lee Mountain, Sally Bell, Copper Dyke, Evergreen, Lexington, Little Jimmy, Little Sampson, Free Speech, Eureka, Stanton and Sampson dumps, Valley Forge, Anna May, Broadway Group, Peerless, and others. The total value of recoverable metals in gold, silver, lead, zinc, and copper in the period from 1940 to 1953, is estimated to be $6,600,000.

The principal country rock is a quartz monzonite with rhyolite forming the capping of Red and Lee Mountains. The ore deposits are auriferous silver-lead deposits enclosed in granite. The prominent joint system that trends N. 85° E., and dips 80° S., apparently controls the emplacement of the ore bodies to the system of jointing. The ore occurs in chambers or shoots, scattered through zones attaining a width of 50 feet in places. Two periods of mineralization are recognized, an older or late Cretaceous, and a younger or late Tertiary.

Scratch Gravel and Grass Valley District

This district is four miles north of Helena. Lode mining began before 1872 and the greater portion of the production came from the Franklin and Scratch Gravel gold mines. The area is underlain by shale, sandstone, and limestone of the Belt series, which has been intruded in the central and southern parts by quartz monzonite. The ore deposits are of two types, contact metamorphic and veins that have filled open fractures and replaced the wall rock. The vein deposits occur in the quartz monzonite and

bordering area of metamorphic rocks. They occur as narrow tabular bodies of two types, gold veins and lead-silver veins. The contact metamorphic deposits are characteristically irregular.

The records show that in the period from 1940 through 1953 the district intermittently produced in recoverable metals of gold, silver, copper, and lead, valued at $137,584. The producing mines during this period were the Franklin, Ajax, Nettie, Oom Paul, Magpie, Umatilla, Julia, Helena Group, Scratch Gravel dump, Herb W. Claim, and others.

Smelter District

Since the start of the zinc fuming plant in 1928 by the Anaconda Company to treat the slag pile and current slag of the American Smelting and Refining Company, the slag pile and plant has been listed as a mining district. However, a considerable portion of the zinc recovered undoubtedly originated in Idaho and elsewhere, and should not be properly classified under mining districts or lode production of Lewis and Clark County.

Wolf Creek (Gladstone) District

The mines of this district lie south and west of Wolf Creek station on the Great Northern Railway, about 30 miles north of Helena. Development began about 1890 and has been carried on sporadically since. The area is underlain by Belt series sediments intruded by a few sills and diorite dikes. To the northeast these sediments are overlain by a great mass of volcanic rocks, chiefly andesite flows tufts, and breccia. The lodes are widely distributed in the Belt rocks, and are narrow but persistent in length and depth in veins. The district has produced very little in recoverable metals of gold, silver, or copper, since 1940. The total value is estimated at less than $1,000 for this period.

York District

The York district is on Trout Creek in the Belt Mountains about 15 miles northeast of Helena. Placer gold was discovered in 1864. The district is underlain by quartzites, limestone, and shales of the pre-Cambrian Belt series. Intrusive rocks forming sills, dikes, and small stocks are sparingly distributed throughout the district.

The ore deposits are both lodes and placers. Most of the small gold-quartz veins occur along fractures in quartz diorite dikes or bedding planes in the shale. Ore shoots vary greatly up to several feet in width and several hundred feet in length. At the Golden Messenger the ore occurs as a replacement deposit along fractures in diorite. The ore shoots are as much as 30 feet thick and are irregular and tabular in form.

The records show no production in recoverable metals from this district since 1940.

SOIL CONSERVATION DISTRICT

Lewis and Clark County is all contained within the boundaries of the Lewis and Clark Soil Conservation District. The district also includes a portion of Jefferson County lying north of Township 6 North. This district was organized in 1949 with headquarters in Helena, Montana. It is a legal subdivision of the state and was established by the farm and ranch operators and owners.

The district is governed by a board of five supervisors who are elected by the land occupiers of the district. They carry out a program of soil erosion control, water conservation, soil fertility man-

agement and proper land use. Furthermore, they have the powers, under state law, to call upon local, state, federal and other agencies to assist in executing the district's program. To date the district supervisors have supplemental memorandums of understanding with the U. S. Soil Conservation Service for providing technical assistance and with the State Extension Service to provide educational assistance. In addition, they have requested and received assistance from many local organizations, business firms and other groups.

With the assistance which the District Governing Body secures from the various agencies and organizations, a work program is developed and carried out. The work program outlines the major soil and water conservation problems. It furthermore indicates the work needed to solve these problems. An annual work plan is prepared each year by the governing body for the scheduling of actual activities which will be stressed and carried out during the year.

Each year the Lewis and Clark District Governing Body publishes a printed annual report showing the accomplishments. This report is distributed to all farm and ranch operators and other interested parties.

The district directly assists farmers and ranchers on a voluntary basis in planning and applying conservation to the land. Most of this assistance is technical, but some assistance is given in other ways, such as, providing earth moving equipment through cooperation with contractors. The technical assistance is provided without cost to the farm or ranch operator. The earth moving work is paid for by the farm or ranch operator.

In Lewis and Clark County there are 382 farmers and ranchers operating about 1,119,000 acres. There is a total of 2,225,280 acres of land in the county including public owned land. The district provides technical assistance on the privately owned land only.

Considerable technical assistance is provided farm and ranch operators to develop basic conservation plans for their land. These plans include detailed soil surveys, range site and condition surveys, ground water surveys and other surveys mostly of the engineering type. The various surveys indicate the kind and amount of conservation work needed to prevent erosion and to develop the resources of the farm or ranch to the maximum. Conservation planning is done with individuals or groups of farmers and ranchers working jointly with the Soil Conservation Service technicians assisting the district.

The farmers or ranchers make the final decisions recorded in the conservation plan based on the various surveys and the counsel of the technicians.

On irrigated land the assistance is given primarily on irrigation systems, land leveling, drainage, pumping plants, water control structures, proper application of irrigation water, soil fertility management and crop rotatons. Considerable of this type of work is being done under the 3,000 acre Nilan Irrigation Reservoir Development near Augusta. Also considerable work is anticipated under the Helena Valley Irrigation Project near Helena.

On dry lands technical assistance is given primarily on stubble mulching, weed control and improved tame pastures. On range lands technical assistance is given on deferred grazing, proper utilization, range reseeding and livestock water development. On woodlands most assistance is for timber stand improvement and selective cutting.

Since the district has been operating, over 5,000 acres of new irrigation has been established on privately owned lands. Improvement on irrigation systems has been made on over 18,000 acres. Seven group irrigation projects and two drainage groups have been assisted. More than 2,500 acres of

hay land have been improved through drainage. Over 15,000 acres of crop land have been leveled for border dike irrigation. Other accomplishments on dry land, range land and wood land are equally impressive.

Excellent progress has been achieved in attaining sound land use. Outstanding cooperation by land owners and operators, various federal, state and local agencies and community groups contributes to the success of the district. The general public realizes the need and importance of community action to conserve water, soil and vegetation for sustained benefits now and for future generations.

NATIONAL FORESTS

The national forests furnish water, recreation, wildlife, timber, forage, and minerals from lands carefully managed as multiple-use public properties. These natural resources are vital to America's industry and people.

Portions of the Flathead, Helena, Lewis and Clark, and Lolo National Forests lie in Lewis and Clark County. These are four of the ten national forests located in Montana. The area of these forests in the county contains portions of seven ranger districts. On the Helena Forest these districts are: the Canyon Ferry District which includes, besides areas in other counties, the area on the west slopes of the Big Belt Mountains from lower Magpie Gulch north to include Willow Creek, all located east of the Missouri River; the Helena District which includes Upper Dog Creek, a tributary of the Little Blackfoot River on the west slopes of the Continental Divide, and Little Prickly Pear, Silver, Seven Mile and Ten Mile Creeks, all draining into the Missouri River; and the Lincoln District, the most part of which lies on the west slopes of the Continental Divide and includes the Blackfoot River and its tributaries, which drain into the Clark Fork of the Columbia River.

On the Lewis and Clark Forest these districts are the Sun River District, which includes the area drained by Falls Creek, the Dearborn River and its tributaries, tributaries of the South Fork of the Sun River and all of the North Fork of the Sun River south and west of this drainage as far north as the Moose Creek divide, and the Teton District, which includes all of the area west of the North Fork of the Sun River north from and including Moose Creek.

On the Lolo Forest, a part of the Seeley Lake Ranger District is located in the county. This is drained by the North Fork of the Blackfoot River and its tributaries, Dry Fork and East Fork.

On the Flathead Forest, a part of the Big Prairie Ranger District is included in the county. This is drained by Danaher Creek, a tributary of the South Fork of the Flathead River.

The Helena area was crossed by Lewis and Clark in July, 1805. Meriwether Lewis camped at the present site of the Meriwether Forest Campground, twenty-seven miles north of Helena in the scenic Gates of the Mountains area.

Lieutenant Mullan built the famous military road for the U. S. Army through a pass on the Continental Divide now called Mullan Pass located on the Helena Ranger District and first crossed this Pass with a four-mule wagon on March 22, 1854. At this Pass in 1862 the first Masonic meeting was held in what is now Montana, which was then in Dakota Territory, by a group of settlers enroute to Oregon. A bronze and rock monument now marks this site.

Many of the rich gold discoveries in what is now Lewis and Clark County were made in or near the Canyon Ferry and Helena Ranger District areas. Besides the rich strikes in Last Chance Gulch,

large values were removed from Rimini, Unionville, Marysville, York, Eldorado Bar and from other locations. Mining activity in these areas at the present time has greatly diminished.

Since a substantial portion of the national forest area in the county was made up of grassy stream bottoms and open or partly open mountain slopes or ridge tops, livestock raising proved to be an important part of the local economy for the early settler and to those who followed him.

After the original area of public domain was set aside by Presidential Proclamation as the Helena, Lewis and Clark, Lolo, and Flathead National Forests in 1906, the use of the grazing areas within their boundaries was controlled by a permit system of grazing, designed to properly use available grazing lands so that they would continue to produce livestock feed year after year. This system has continued until the present time. In 1956 a total of 4,100 cattle, 150 horses, and 11,000 sheep were permitted to graze on national forest ranges in this county on some 43 allotments.

Seasons of use vary between allotments and are based on the vegetative readiness and climate limitations on each allotment. The average season for cattle is from June 1 to September 30 and for sheep, July 1 to September 15. In order to provide for the maximum quantity and quality of water production and obtain optimum use of range forage, the primary objective of the Forest Service is to leave half of the available forage each year after livestock use.

Nearly all of the cattle permitted are owned by stockmen who have obtained a preference use of these ranges through prior use over a long period. Each permittee, to qualify, must own a ranch which will produce hay and forage sufficient to carry his permitted stock through the period they graze off the forest range. In this manner the forest permit rounds out a complete and economic ranching operation. A fee is charged each year for the privilege of grazing on national forest range. This fee is based on livestock sale prices for the preceding year adjusted to a previously established base.

In line with the principle of multiple and wise use of the natural resources, all uses of the national forests are managed and coordinated for maximum good water management. The Helena National Forest supplies the domestic water supplies for the cities of Helena and East Helena in the amounts of 6¾ to 9 million gallons, and 140 to 200 thousand gallons daily, respectively.

The national forest area in this county, located east of the Continental Divide, supported a fair stand of Ponderosa Pine, Douglas Fir, Lodgepole Pine and Engelmann Spruce, commercial timber of the type found in central Montana. Most of this merchantable timber was logged as a result of the heavy demand through the years for the many forest products used in the growth and development of the railroads, the City of Helena, other adjacent towns, early mines, ranches and farms. In this area much of the remaining stand is predominantly second growth or in small virgin stands not tapped by roads. On the west side of the Continental Divide where better timber sites prevail, there remain larger areas of uncut merchantable timber. All timber cut from the national forests is in accordance with an over-all management plan designed to harvest ripe timber and leave the residue stands in thrifty condition both to regenerate timber for the future and to maintain and improve watershed values at optimum levels.

Timber sale contracts require that the operator either dispose of the resulting slash in a manner conducive to good fire prevention and erosion control principles or deposit funds into a cooperative work allotment to be used by the Forest Service in doing such work. This reduces the fire hazard and provides for erosion control on sale areas where abuse of unstable soils would contribute to serious siltation of existing streams.

Recreation has become a major use of the national forest lands in the county. This use will steadily increase in the future, with increased leisure and population. In 1956 the estimated number of annual visits by recreationalists to the national forest areas in the county approximated 150,000.

Camping and picnicking facilities are provided on several improved campgrounds in the various districts. These are McDonald Pass, Cromwell Dixon, Ten Mile and Crystal Creek Campgrounds on the Helena District, the Meriwether Campground on the Canyon Ferry District, the Aspen Campground on the Lincoln District, and the Bench Mark, Home Gulch and Beaver Creek Campgrounds on the Sun River District.

These areas are developed so that adequate sanitation measures as called for by State law are provided, such as safe drinking water, flyproof and sanitary toilets and adequate garbage disposal. These measures protect not only the health of the recreationalist but also prevent contamination of adjacent streams or springs.

There are many summer home residences under Forest Service special use permits scattered over the national forest area. These must be built on designated sites so that there is no danger of stream pollution and the fire hazard is at a minimum.

One of the important recreation uses of the national forests in the county is made by hunters and fishermen. It is estimated that hunters use the national forest area 22,050 hunter-days and fishermen 25,600 fishermen-days. This area provides a habitat for 6,000 elk, 20,500 mule and 2,100 white-tail deer, 45 moose, 650 black and 80 grizzly bear, 300 mountain sheep and 300 mountain goats.

A portion of the 990,900-acre Bob Marshall Wilderness Area is located in the northernmost corner of the county in Flathead, Lewis and Clark and Lolo Forests. This is primarily a country for extensive saddle and pack trips. It contains beautiful camp spots, with abundant horse feed. There are many streams and a few lakes affording excellent fishing. Game animals of all kinds are abundant. The Chinese Wall, which breaks to the east in sheer 1,000-foot cliffs for 20 miles along the Continental Divide, is a unique attraction.

There has been a sharp increase in deer numbers in the past decade to the extent that damage is noted on critical winter deer ranges. Special efforts through the Montana State Fish and Game Department have been and are being made to protect the watershed values by the reduction of deer numbers through increased bag limits, either sex kills and special seasons. Big game numbers under a multiple use scheme of management should be kept in balance with other uses made of the national forest lands.

Forest lands must be protected from fire, insects and disease. Fires are detected by a combination of fixed lookouts, local cooperators and aerial patrols with telephone and radio communication. In the Lewis and Clark county portion of the national forest areas, eleven lookout stations are manned during the fire season. Smokejumpers are called from the Aerial Fire Depot at Missoula when fires occur at inaccessible locations. An average of 50 fires occur annually in this area, of which 13 are man-caused. Unfortunately, the man-caused fires are usually the largest and most costly to extinguish.

An infestation of spruce budworm, a defoliator, which attacks Douglas Fir Trees in this area, has necessitated an aerial spray program in which state and federal agencies cooperate with the local landowners. Unless controlled, this infestation will seriously damage watershed values in the county.

By law, twenty-five per cent of the earnings from timber sales, grazing fees and other commercial uses of the national forests is returned to the State each year for distribution to the counties in which national forests are located to help maintain public schools and roads. An additional ten per cent is used locally for construction and maintenance of roads and trails. The remaining sixty-five percent is deposited in the U. S. Treasury and may be disbursed only by congressional appropriation. For fiscal year 1956 Lewis and Clark County received, as its share of the twenty-five per cent fund disbursement, $21,947.35.

SUMMARY OF IRRIGATED LAND BY RIVER BASINS IN THE FOLLOWING COUNTIES COMPLETED TO DATE

Big Horn, Broadwater, Carbon, Custer, Deer Lodge, Gallatin, Golden Valley, Jefferson, Lewis & Clark, Madison, Meagher, Musselshell, Park, Rosebud, Silver Bow, Stillwater, Sweet Grass, Treasure, Wheatland and Yellowstone.

RIVER BASIN	Present Irrigated Acres	Irrigable Acres Under Present Facilities	Maximum Irrigable Acres
‡Missouri River Drainage Basin			
***Missouri River**	71,442	16,476	87,918
Jefferson River	61,291	9,713	71,004
Beaverhead River	40,771	6,076	46,847
Big Hole River	23,775	1,950	25,725
Madison River	39,445	7,660	47,105
Gallatin River	111,914	21,097	133,011
Smith River	30,304	18,398	48,702
Sun River	11,157	2,313	13,470
Musselshell River	64,789	57,870	122,659
Grand Total Missouri River Basin	**454,888**	**141,553**	**596,441**
‡Yellowstone River Drainage Basin			
Yellowstone River	299,053	96,088	395,141
Stillwater River	27,489	16,403	43,892
Clarks Fork River	91,768	24,195	115,963
Big Horn River	65,395	25,579	90,974
Tongue River	22,137	7,479	29,616
Powder River	8,264	1,804	10,068
Grand Total Yellowstone River Basin	**514,106**	**171,548**	**685,654**
‡Columbia River Drainage Basin			
Clark Fork (Deer Lodge, Hellgate, Missoula) **River**	17,535	1,988	19,523
Grand Total Columbia River Basin	**17,535**	**1,988**	**19,523**
Grand Total In Counties Completed to Date	**986,529**	**315,089**	**1,301,618**

‡Totals for each stream includes all tributaries except those specifically listed.

*Names of streams indented on the lefthand margin indicate that they are tributaries of the first stream named above which is not indented.

IRRIGATION SUMMARY OF LEWIS AND CLARK COUNTY BY RIVER BASINS

MISSOURI RIVER BASIN	Present Irrigated Acres	Irrigable Acres Under Present Facilities	Maximum Irrigable Acres
*Missouri River	5,107	1,184	6,291
Magpie Creek	33	0	33
Spokane Creek	47	33	80
Mitchell Gulch Creek	0	0	0
Mud Springs (Dahlhausen)	31	0	31
Trout Creek	67	13	80
Soup Creek	0	39	39
Unnamed Spring	4	0	4
Prickly Pear Creek	4,543	669	5,212
McClellan Creek	252	138	390
Wells	37	13	50
Unnamed Springs and Waste	90	0	90
Stansfield Lake	32	0	32
Waste & Drain	89	34	123
Ten Mile Creek	3,051	415	3,466
Moose Gulch Creek	20	0	20
Lazyman Creek	10	0	10
Bear Gulch Creek	10	0	10
Walker Creek	67	0	67
North Fork Walker (Big Porcupine) Creek	38	0	38
Negro Gulch Creek	8	0	8
Little Porcupine Creek	87	0	87
Norton (Sweeney) Creek	109	0	109
Unnamed Springs	6	0	6
Colorado Creek	44	0	44
Blue Cloud Creek	0	10	10
Nursery Wells	10	0	10
Seven Mile Creek	1,039	58	1,097
Austin Creek	19	0	19
Greenhorn Creek	23	0	23
Park Gulch Creek	55	0	55
Wells	3	15	18
Silver Creek	511	122	633
Three Mile Creek	127	0	127
Wells	5	0	5
Smith Fork of Prickly Pear (Spring) Creek	8	0	8
Unnamed Springs	39	0	39
Total Prickly Pear Creek and Tributaries	**10,332**	**1,474**	**11,806**

IRRIGATION SUMMARY OF LEWIS AND CLARK COUNTY BY RIVER BASINS

MISSOURI RIVER BASIN—(continued)	Present Irrigated Acres	Irrigable Acres Under Present Facilities	Maximum Irrigable Acres
Beaver Creek	235	0	235
Hunters Gulch Creek	6	0	6
Towhead (Ming) Creek	221	215	436
Sperry (Bear Tooth) Creek	96	0	96
Well	20	0	20
Rose (Falls Gulch) Creek	42	0	42
Timber Gulch Creek	8	0	8
Spring Creek	0	12	12
Little Prickly Pear Creek	2,628	260	2,888
South Fork Little Prickly Pear (Beaver) Creek	59	0	59
Deadman Creek	125	0	125
Cottonwood Creek	10	0	10
Lost Horse Creek	10	0	10
Marsh Creek	165	0	165
Three Springs	50	0	50
Canyon Creek	1,280	290	1,570
Virginia Creek	0	0	0
Gould Creek	165	0	165
Mill Creek	50	0	50
Sawmill Creek	14	0	14
Big Sheep Creek	25	0	25
Clark Creek	40	0	40
Wolf Creek	12	0	12
Long Gulch Creek	8	0	8
Total Little Prickly Pear Creek and Tributaries	**4,641**	**550**	**5,191**
Rock Creek	481	233	714
Wells Fork Rock Creek	17	0	17
Dog Creek	154	0	154
Stickney Creek	8	0	8
Dearborn River	39	0	39
North Fork Dearborn River	2,466	707	3,173
Clemons Creek	45	0	45
Cunniff Creek	98	0	98
McClain Creek	24	0	24
Middle Fork Dearborn River	97	0	97
Skunk Creek	0	0	0
Little (South Fork) Skunk Creek	5	0	5
South Fork Dearborn River	439	98	537
Routt Creek	5	0	5

IRRIGATION SUMMARY OF LEWIS AND CLARK COUNTY BY RIVER BASINS

MISSOURI RIVER BASIN—(continued)	Present Irrigated Acres	Irrigable Acres Under Present Facilities	Maximum Irrigable Acres
Roberts Creek	5	0	5
Johnson Creek	5	0	5
Flat Creek	391	0	391
Total Dearborn River and Tributaries	**3,619**	**805**	**4,424**
Sun River	653	339	992
North Fork Sun River	273	0	273
Willow Creek	1,004	57	1,061
Little Willow Creek	824	149	973
Barr Creek	89	29	118
Rose (Furman) Creek	43	0	43
South Fork Sun River	4,526	1,316	5,842
Smith Creek	1,432	0	1,432
Ford Creek	1,888	198	1,386
Elk (DuBray) Creek	584	122	706
Blubber Creek	0	25	25
Goss Creek	52	0	52
Miscellaneous Drainage	164	16	180
Lemon Springs	12	0	12
Dry Creek	144	0	144
Simms (Spring) Creek	169	62	231
Total Sun River and Tributaries	**11,157**	**2,313**	**13,470**
Total Missouri River Basin	**36,326**	**6,871**	**43,197**
COLUMBIA RIVER BASIN			
Clark Fork of the Columbia (Missoula, Hellgate) **River**	0	0	0
Blackfoot River	385	443	828
Alice Creek	18	0	18
Toms Creek	16	0	16
Landers Fork of Blackfoot River	0	0	0
Indian Meadow Creek	27	0	27
Wells	33	0	33
Poor Man's Creek	241	0	241
Humbug Creek	11	0	11
Keep Cool Creek	295	0	295
Sucker Creek	33	0	33
Liverpool Creek	55	0	55
Stonewall Creek	90	107	197

IRRIGATION SUMMARY OF LEWIS AND CLARK COUNTY BY RIVER BASINS

COLUMBIA RIVER BASIN—(Continued)	Present Irrigated Acres	Irrigable Acres Under Present Facilities	Maximum Irrigable Acres
Park Creek	23	0	23
Beaver Creek	470	0	470
Lincoln Creek	16	0	16
Clear Creek	48	0	48
Willow Creek	120	0	120
Bear Creek	18	0	18
Total Blackfoot River and Tributaries	**1,899**	**550**	**2,449**
Total Columbia River Basin	**1,899**	**550**	**2,449**
Total All Irrigation Lewis and Clark County	**38,225**	**7,421**	**45,646**

* Names of streams indented on the left hand margin indicate that they are tributaries of the first stream named above which is not indented.

DEARBORN CANAL AND WATER COMPANY

HISTORY

The lands now served by the Dearborn Canal and Water Company were first included in a Carey Land Act Project in the year of 1905. At that time the Dearborn Project planned to store and divert the waters of the Dearborn River for the irrigation of 36,000 acres south of Gilman. After constructing 20 miles of ditch at a cost of $200,000 the project was dropped. On November 8, 1911, the contract with the Dearborn Canal Company was declared void and the land relinquished to the U. S. Government.

On the 29th day of May, 1913, the Dearborn Canal and Water Company was incorporated for a period of 40 years. This new canal company includes only a small part of the land area proposed for irrigation by the Dearborn Project of 1905-1911. Among the first water users in the Dearborn Canal and Water Company were: S. W. Mosher, Jacob C. Fey, John Barrett, Levi La Chapelle, C. E. La Chapelle, Edmond La Chapelle, and W. J. Myles. Capital stock of the incorporation was set at $50,000, divided into 5,000 shares at a par value of $10.00 per share. The stock of the company was to be declared as non-assessable.

After expiration of their Articles of Incorporation May 28, 1953, the Dearborn Canal and Water Company re-incorporated for another 40 year period.

PRESENT STATISTICS

Location: The Dearborn Canal diverts water from the North Fork of the Dearborn River in NE¼ SW¼ of Section 27, T. 18N., R. 7W., and follows a northeasterly direction for 4.1 miles where it spills into the headwaters of Flat Creek in SW¼NW¼ of Section 18, T. 18N., R. 6W. Using this drainage as a carrier for 1.8 miles it takes out again in the NW¼SE¼ of Section 8, T. 18N., R. 6W., and continues northerly 5.5 miles to NE¼SW¼ of Section 29, T. 19N., R. 6W. Water is also spilled into Flat Creek from the canal in NE¼SE¼ of Section 8, T. 18N., R. 6W., and taken out of Flat Creek by various private diversions.

Land irrigated under the canal is located in Sections 7, 16, 17, and 21, Township 18N., Range 4W.; Sections 5, 6, 7, 8, 9, 10, 11, 12, 19, 20, 29, and 30, Township 18N., Range 5W.; Sections 2, 3, 4, 7, 8, 9, 14, 15, 17, 18, and 24, Township 18N., Range 6W.; Sections 23 and 24, Township 18N., Range 7W.; and Sections 19, 20, 29, 30, 33, 35, and 36, Township 19N., Range 6W.

Length and Capacity of Canal: Total length of the main canal system is 9.6 miles, exclusive of the drainage used as a carrier for the canal water. The capacity of the canal is about 100 second feet, which is more than sufficient for the acreage irrigated.

Operation and Maintenance: Assessments for O. & M. have averaged only 20 cents per share of stock owned in the company for the past several years. One share of stock is equivalent to 1 miner's inch of water.

Present Users: All of the 5,000 shares of stock in the corporation are subscribed to in various amounts among 8 water users.

Acreage Irrigated In 1956 there were 2,437 acres irrigated from the Dearborn Canal, with 707 acres potentially irrigable under the system.

WATER RIGHT DATA

Claimed by the Dearborn Canal and Water Company are two appropriated water rights as follows:

1. From the Dearborn River by the State Board of Arid Land Commission, 16,000 miner's inches as of the Date December 6. 1899. (Ref: Book H, Page 550 of Ranches and Ditches, Lewis and Clark County Courthouse, Helena, Montana).

2. Appropriated by Donald Bradford from the Dearborn River as of the date July 18, 1888 for 300,000 miner's inches. (Ref: Book F, Page 446 of Ranches and Ditches, Lewis and Clark County Courthouse, Helena, Montana).

(See Maps in Part II, Pages 30, 31, 32, 33 & 34).

THE HELENA VALLEY AND LAKESIDE WATER USERS' ASSOCIATIONS

HISTORY

The irrigation project which is now known as the Helena Valley Water Users' Association and the Lakeside Water Users' Association, was created on June 10, 1912, under the name of the Montana Reservoir and Irrigation Company, a subsidiary of the Montana Power Company. From the date of its incorporation in 1912 this company operated continuously for a period of 22 years. The beginning of the drouth and the depression in the early 1930's resulted in the Montana Power Company taking possession of the project from the Montana Reservoir and Irrigation Company in 1934.

In January, 1946, the Power Company deeded the entire project over to the Montana State Water Conservation Board. Management of the project by the State Water Conservation Board required the formation of the Helena Valley Water Users' Association and the Lakeside Water Users' Association, both of which are operating at the present time.

When the Montana Power Company deeded the project to the Water Board in 1946, it was agreed that the Board would continue operation of the project until such a time when the proposed Helena Valley Irrigation District project for the same area would be completed by the Bureau of Reclamation. This project is now under construction and when completed it will furnish water to all the land now irrigated by the Helena Valley and Lakeside Water Users' Associations, a supplemental supply to the City of Helena, totaling 13,000 acres in the Helena Valley.

The Helena Valley Irrigation District was created by a Decree of the District Court (First Judicial District, Helena) on June 30, 1955. Briefly, the project consists of pumping water from Canyon Ferry Reservoir, diverting it through a tunnel which will pierce the Spokane Hills; carrying the water through a canal to a regulating reservoir on the Spokane Bench, from which water will be diverted through a canal system around the south, west, and north edges of the Helena Valley, terminating at the northeast corner of the valley where the tail water will be discharged into Lake Helena. The construction of the tunnel through the Spokane Hills began on February 22, 1957, and it is planned to have water delivered to the project land by May 1, 1959.

PRESENT STATISTICS

Location: The Helena Valley Water Users' Association irrigation system consists of a pumping plant containing three (3) 600 H. P. electric pumps and is located on the north shore of Lake Helena

in S½SE¼ of Section 13, T. 11N., R. 3W. At the pumping plant water from an average lift of 110 feet is discharged into two canals. The land irrigated is located in Sections 13, 14, 15, 16, 17, 19, 20, 21, 22, 28, 29, 30, and 31, T. 11N., R. 3W.; and Section 18, T. 11N., R. 2W.

The Lakeside Water Users' Association has its pumping station located on the east shore of Lake Helena in SW¼NE¼ of Section 19, T. 11N., R. 2W. Pumping facilities consist of two (2) 900 H. P. pumps, which discharge water into the main canal at an average lift of 165 feet. Lands irrigated are located in Sections 17, 19, 20, 21, 27, 28, 30, 31, 33, 34, and 35 in T. 11N., R. 2W.; and in Sections 1, 2, 3, 10, 11, and 12, T. 10 N., R. 2W.

Length and Capacity of Canals: Length of canals "A" and "B" for the Helena Valley Water Users' Association are 5.2 miles and 7.6 miles respectively, with both canals having an initial capacity of approximately 85 second feet.

The main canal for the Lakeside Water Users' Association is about 9½ miles long, with an initial capacity of 75 second feet.

Operation and Maintenance: Water charges for the Helena Valley Water Users' Association in 1956, including O. & M., were $4.75 per acre for 2½ acre feet of water or water entitled to be used. A special rate is given the number of acre feet used over the amount each water user is entitled to use. This special rate is 25 cents per acre foot, plus the power charge, making a total of $1.40 per acre foot for additional water.

Water charges for the Lakeside Water Users' Association in 1956 were $4.60 per acre foot of water used which includes operation and maintenance of the canal system.

Present Users: During the irrigation season of 1956 there were 31 water users under the Helena Valley project using 7,010 acre feet of water.

The Lakeside project water users totaled 17 in 1956 and purchased 1,797 acre feet of water.

Acreage Irrigated: In 1956 there were 2,937 acres irrigated from the Helena Valley Water Users' Association canal system and 423 acres potentially irrigable under existing ditch facilities.

The Lakeside Water Water Users' project had 1,559 acres irrigated in 1956 and 726 acres potentially irrigable.

WATER RIGHT DATA

The water rights that apply to the Helena Valley and Lakeside Water Users' Associations were transferred by deed to the Montana Power Company by the Montana Reservoir and Irrigation Company on May 5, 1934.

These water rights are described as follows:

1. Two thousand (2,000) cfs, legal measurement of the waters of the Madison River in Galatin County, Montana, appropriated by Max Hebgen on April 30, 1906, and recorded May 5, 1906, on page 154, Book 3 of Water Rights in the records of Gallatin County, Montana.

2. Six thousand (6,000) cfs, legal measurement of the waters of the Madison River in Gallatin County, Montana, appropriated by J. L. Templeman on May 29, 1906, and recorded June 6, 1906, on pages 159 and 160, Book 3 of Water Rights in the records of Gallatin County, Montana.

3. Also a certain water right described as three thousand (3,000) cfs, of the waters of the Missouri River in Lewis & Clark County, Montana, appropriated by the Helena Power Transmission Company on August 10, 1906, and recorded August 27, 1906, on page 568, Book "L" of Placers in the records of Lewis & Clark County, Montana.

(See Maps in Part II, Pages 2, 8 & 9).

NILAN WATER USERS ASSOCIATION

(Including the Florence Canal)

HISTORY

This project is located in the northern part of Lewis and Clark County, seven miles west of the town of Augusta. It consists of a diversion canal from Smith and Ford Creeks diverting water to a bench reservoir, where two outlet (supply) canals furnish water for the irrigation of lands along Willow Creek, Smith Creek and the South Fork of the Sun River.

The Nilan Storage Project was built by the State Water Conservation Board, which required the formation of the Nilan Water Users Association, and water purchase contracts between the water purchaser, the Association and the Board. (See Water Marketing and Water Purchase Contract Page 43).

Prior to awarding the construction contract in September 7, 1950, the Nilan Water Users Association filed articles of incorporation on June 20, 1950, for a period of forty years.

According to the Engineering Report of October 27, 1951, the Nilan Storage Reservoir will supply supplemental water to about 9,000 acres and a full supply to 1,000 acres under the project. The project first operated during the year of 1952 under the Nilan Water Users Association.

PRESENT STATISTICS

Location: The diversion canal diverts from the north bank of Smith Creek in Section 4, T. 19N., R. 8W., crossing Ford Creek in Section 26, T. 20N., R. 8W., where it empties into the Nilan Reservoir in Section 24, T. 20 N., R. 8W. The reservoir occupies parts of Sections 17, 18, 19, and 20, T. 20N., R. 7W. and Section 24, T. 20N., R. 8W. From the reservoir the east supply canal diverts in Section 20, T. 20N., R. 7W., and courses southerly to where it empties into Smith Creek in Section 33, T. 20N., R. 7W. for irrigation of lands on the both sides of the South Fork of the Sun River in the vicinity of Augusta. The north supply canal diverts from the reservoir in Section 18, T. 20N., R. 7W., and follows a northerly direction to its confluence with Willow Creek in Section 7, T. 20N., R. 7W., to serve lands along the south side of Willow Creek northwest of Augusta. Lands to be irrigated are located in parts of Townships 20 and 21N., Ranges 6 and 7W.; Township 20N., Range 5W.; and Township 20N., Range 8W.

During the year of 1956 the upper part of the diversion canal from Smith Creek to Ford Creek was not used, due to a wash out in 1955 along the bank of the canal. Repair work on this part of the diversion canal has been completed and it will again be in operation for the year of 1957.

Besides furnishing water to private ditches out of Willow Creek, Smith Creek and the South Fork of the Sun River, the project also supplies water to the Florence Canal. Point of diversion for the Florence Canal is from Smith Creek in the SE¼ of Section 33, T. 20N., R.. 7W. It has a capacity of 75 second feet and is approximately 15 miles long. During the summer of 1956 some reconstruction

work on the Florence Canal was made and when the distribution systems for the individual water users are completed, about 4,000 acres will be irrigated from this canal.

Principal Features: The diversion canal from Smith Creek to Ford Creek has a capacity of 200 second feet and is 4.1 miles long. From Ford Creek the diversion canal has a capacity of 300 second feet and a length of 1.8 miles to the reservoir. At both Smith and Ford Creeks the diversion dams are built of concrete. The crest length on the Smith Creek diversion structure is 108 feet, with a height of 1.75 feet; on Ford Creek the diversion structure has a crest length of 63.3 feet and a height of 5.5 feet.

The total drainage area above the diversion canal is 44 square miles, with 26 square miles above the Smith Creek gage and the remaining 18 square miles above the Ford Creek gage.

The Nilan Reservoir was created by utilizing an old glacial lake. In order to utilize and control the storage it was necessary to construct two dams—one on the north side and the other on the east side of the lake. The reservoir has a storage capacity of 10,000 acre feet and covers a flooded area of 525 acres.

The North Dam is an earth fill structure 530 feet long, a bottom width of 225 feet; height above the bottom outlet conduit 54 feet; also a dike 1,300 feet long. From the dam the outlet canal to Willow Creek has a capacity of 75 second feet and is 1.1 miles long.

The East Dam is also an earth fill structure, with a top width of 20 feet and the height above the bottom outlet conduit of 51 feet. The outlet canal to Smith Creek has a capacity of 75 second feet and is 3.6 miles long.

Another feature of this project is to raise the level of Soap Lake for the additional storage of 1,600 acre feet of water.

Operation and Maintenance: Water charges for the project are $1.50 per acre foot which include 50 cents for operation and maintenance and $1.00 for construction. In the Florence Canal the water charge is 25 cents for O. & M. and 33 cents for construction in addition to the $1.50 per acre foot paid to the Nilan Water Users Association for storage water.

Present Users: In the year of 1956 there were twenty-two water users (including the Florence Canal) under contract to purchase 5,800 acre feet of water from the Nilan Storage Project.

Acerage Irrigated: Under this project in 1956 there were 936 acres furnished a full supply and 3,273 acres receiving a supplemental supply, with 284 acres potentially irrigable under existing ditch facilities.

WATER RIGHT DATA

Water right filings for the Nilan Storage Project were made by the State Water Conservation Board on August 30, 1950, and are as follows: From Ford Creek and tributaries all the unappropriated waters as of the date August 22, 1950. Reference: (Recorded and filed in Book 48, Miscellaneous Records, Page 220, Lewis and Clark County). From Smith Creek and Tributaries all the unappropriated waters, dated August 22, 1950. Reference: (Recorded and filed in Book 48, Miscellaneous Records, Page 221, Lewis and Clark County).

(See Maps in Part II, Pages 34, 38, 39, 40, 41, and 42).

WATER MARKETING CONTRACT

This is an agreement between the Water Users' Association and State Water Conservation Board; whereby the Board agrees to sell to the Association all of the available water of the project and the Association agrees to distribute same to water purchasers and provide method of payment of sums due, levying of assessment for operation and maintenance cost, time of notification of such levy to be given water purchasers, time of default and remedies in the event of default.

WATER PURCHASE CONTRACT

This is a three party contract entered into between the individual water purchaser, the Association and the State Water Conservation Board; whereby, the individual agrees to purchase a definite amount of water and to pay therefore a definite sum of money on or before a definite day, until a definite future date; in addition to such definite annual sum, the individual agrees to pay such additional sum or sums as may be required annually as his proportionate share of the cost of operation and maintenance of the Association. This contract is void unless the water purchaser executes a Subscription and Pledge Agreement.

WATER RIGHT DATA — LEWIS AND CLARK COUNTY

APPROPRIATIONS AND DECREES BY STREAMS

STREAMS	APPROPRIATIONS (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per. Sec.	DECREED RIGHTS Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
MISSOURI RIVER BASIN							
***Missouri River**	27	10,442,060	261,051.500				
Correll Creek	1	500	12.500				
Cotton Creek	1	150	3.750				
Scott Creek	1	200	5.000				
Hellgate Creek	6	800	20.000				
Unnamed Spring	1	200	5.000				
Spring Creek	4	470	11.750				
Little Hellgate Creek	1	200	5.000				
Unnamed Springs	2	130	3.250				
Magpie Creek	8	800	20.000	10572	2	150	3.750
Fox Gulch Creek	1	All	—				
Unnamed Spring	1	200	5.000				
Cave Gulch Creek	10	664	16.600				
Cave Gulch Springs	1	—	—				
Unnamed Spring	1	—	—				
Unnamed Spring	1	10	.250				
Horse Gulch Creek	2	150	3.750				
Unnamed Slough	1	1,000	25.000				
Oregon Gulch Creek	6	205	5.125				
Clarks Creek	4	164	4.100				
Spokane Creek	7	2,110	52.750	2187	1	90	2.250
				5764[1]	1	90	2.250
				73[2]	1	300	7.500
				9198	1	100	2.500
Unnamed Springs	4	95	2.375				
Willow Springs	1	50	1.250				
Mitchell Gulch Creek	3	500	12.500				
Mudd Springs	1	100	2.500				
Mud Springs	1	150	3.750				
Unnamed Spring	1	10	.250				
McDonald Gulch Creek	1	50	1.250				
Centennial Gulch Creek	0	0	0.000				
Unnamed Spring	1	4	.100				
Unnamed Springs	3	60	1.500				
McGuire Creek	1	50	1.250				
McGuire Spring	1	—	—				
Cedar Gulch Creek	1	100	2.500				
Unnamed Springs	2	All	—				
Unnamed Creek	1	2	.050				
Unnamed Spring	1	100	2.500				
Trout Creek	42	37,220	930.500	16631	8	775	19.375
South Fork Trout Creek	1	200	5.000				
North Fork Trout Creek	1	All	—				
Station Creek	1	50	1.250				
Goodman Gulch Creek	0	0	0.000				
Unnamed Spring	1	400	10.000				
Blacksmith Gulch Creek	0	0	0.000				
Unnamed Spring	1	100	2.500				
Kelly Gulch (Billie) Cr.	2	35	.875				
Browns Gulch Creek	0	0	0.000	16631	(See Trout Creek)		
York (New York) Gulch Creek	4	100	2.500				
Rattlesnake Gulch Creek	2	100	2.500				
Little Rattlesnake Gulch Creek	1	50	1.250				

* Names of streams indented on the lefthand margin indicate that they are tributaries of the first stream named above which is not indented.

WATER RIGHT DATA — LEWIS AND CLARK COUNTY

APPROPRIATIONS AND DECREES BY STREAMS

STREAMS	APPROPRIATIONS (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per. Sec.	DECREED RIGHTS Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
Unnamed Spring	1	30	.750				
Kingsbury Gulch Creek	5	140	3.500				
German Gulch Creek	1	All	—				
Unnamed Spring	1	10	.250				
Soup Creek	9	1,500	37.500				
Ballaret Creek	3	700	17.500				
Sweats Gulch Creek	1	40	1.000				
Bull Run Creek	3	210	5.250				
Spring Creek	1	100	2.500				
Prickly Pear Creek	50	14,798	369.950	668[3]	27	3,737.5	93.438
				4643[4]	32	2,530	63.250
				10316	1	720	18.000
				20645	2	634	15.850
Morrows Gulch Creek	1	500	12.500				
Unnamed Swamp	1	100	2.500				
Spring Creek	0	0	0.000	668	(See Prickly Pear Creek)		
Clancy Creek	0	0	0.000	668	(See Prickly Pear Creek)		
Crystal Creek	0	0	0.000	668	(See Prickly Pear Creek)		
Lump Gulch Creek	0	0	0.000	668	(See Prickly Pear Creek)		
Lost Creek	0	0	0.000	668	(See Prickly Pear Creek)		
Jackson Creek	0	0	0.000	668	(See Prickly Pear Creek)		
McClellan Creek	0	0	0.000	20645	(See Prickly Pear Creek)		
Holmes Gulch Creek	1	150	3.750				
Unnamed Creek	2	200	5.000				
Rinker Spring	1	100	2.500				
Unnamed Spring	1	25	.625				
Wildcat Slough	2	800	20.000				
Unnamed Creek	2	110	2.750				
Unnamed Springs	3	200	5.000				
Unnamed Drain	2	325	8.125				
Flowerree Slough	2	100	2.500				
Unnamed Springs	2	160	4.000				
Ten Mile Creek	45	14,740	368.500	4989	55	5,453	136.325
				9014	1	240	6.000
Butlers Lake	1	—	—				
Capital Creek	1	300	7.500				
Coon Hollow Creek	1	—	—				
Hunter Gulch Creek	1	20	.500				
Right Fork Hunter Gulch Creek	1	10	.250				
North Fork Ten Mile Creek	2	200	5.000				
Potts Spring	1	50	1.250				
Try Again Creek	2	1,500	37.500				
Unnamed Creek	3	110	2.750				
Unnamed Springs	2	145	3.625				
Monitor Creek	1	All	—				
Unnamed Spring	1	25	.625				
Ruby Creek	5	1,900	47.500				
East Fork Ruby Cr.	3	325	8.125				
West Fork Ruby Cr.	1	25	.625				
Banner Creek	5	3,900	97.500				
Left Fork Banner Cr.	1	400	10.000				
Beaver Creek	14	3,160	79.000				
S. Fork Beaver Cr.	1	All	—				
Lee Mountain Creek	2	150	3.750				
Clear Creek	2	80	2.000				
Spring Creek	4	1,252	31.300				
Wilson Creek	1	150	3.750				
Minnehaha Creek	5	1,800	45.000				

WATER RIGHT DATA — LEWIS AND CLARK COUNTY

APPROPRIATIONS AND DECREES BY STREAMS

STREAMS	APPROPRIATIONS (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per. Sec.	DECREED RIGHTS Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
Rock Creek	1	50	1.250				
Tributary of Minnehaha Creek	2	150	3.750				
Whiskey Creek	3	200	5.000				
Unnamed Creek	1	100	2.500				
Deer Creek	7	1,800	45.000				
Moose Creek	4	700	17.500				
Lazyman Gulch Creek	1	All	——				
Bear Creek	3	310	7.750				
Unnamed Spring	1	50	1.250				
Walker Creek	13	2,100	52.500				
Right Fork Walker Creek	1	40	1.000				
Unnamed Spring	1	500	12.500				
Tributary of Walker Creek	1	100	2.500				
W. Fork Walker Cr.	2	300	7.500				
N. Fork Walker (Big Porcupine) Creek	3	200	5.000				
K. C. Springs	1	40	1.000				
Negro Gulch Creek	1	All	——				
Little Porcupine Cr.	2	60	1.500				
Unnamed Spring	1	25	.625				
Allbrights Gulch Creek	1	200	5.000				
Norton (Sweeney) Cr.	2	260	6.500				
Unnamed Creek	2	150	3.750				
Motor Creek	1	25	.625				
Unnamed Creek	2	160	4.000				
Willow Creek	6	2,210	55.250				
Unnamed Creek	1	50	1.250				
Colorado Creek	6	600	15.000				
Left Fork Colo. Cr.	1	100	2.500				
Middle Fork Colo. Cr.	1	200	5.000				
Unnamed Creek	1	200	5.000				
Spring Creek	1	20	.500				
Primrose Creek	1	50	1.250				
Trib. Primrose Cr.	1	40	1.000				
Nelson Gulch Creek	2	512	12.800	902 O. S.	1	All	——
Cedar Springs	1	10	.250				
Kaiser Gulch Creek	1	25	.625				
E. Fork Kaiser Gulch Creek	1	400	10.000				
Blue Cloud Creek	5	100	2.500				
Champaign Creek	1	250	6.250				
Snowshoe Gulch Cr.	1	100	2.500				
Pilgrim Gulch Creek	1	50	1.250				
Sherry Creek	1	50	1.250				
Cordwood Gulch Creek	1	All	——				
Independence Gulch Cr.	3	70	1.750				
Shaffer Gulch Creek	1	20	.500				
Unnamed Creek	3	160	4.000				
Unnamed Spring	1	60	1.500				
Grass Valley Springs	1	50	1.250				
Unnamed Springs	3	190	4.750				
Daisy Lode Spring	1	75	1.875				
Unnamed Creek	1	20	.500				
Unnamed Swamps	3	700	17.500				
Unnamed Spring	1	12	.300				
Seven Mile Creek	21	5,475	136.875	5860	15	2,011	50.275

WATER RIGHT DATA — LEWIS AND CLARK COUNTY

APPROPRIATIONS AND DECREES BY STREAMS

STREAMS	APPROPRIATIONS (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per. Sec.	DECREED RIGHTS Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
La Fontaine Springs	1	1	.025				
Rocky Spring	1	5	.125				
Austin Creek	4	630	15.750	5860	(See Seven Mile Creek)		
Coal Gulch Creek	1	All	——				
Branch Austin Cr.	1	6	.150				
Mullan Gulch Cr.	1	10	.250				
Unnamed Creek	2	3	.075				
Greenhorn Gulch Cr.	13	1,460	36.500	5860	(See Seven Mile Creek)		
Summit Gulch Cr.	2	100	2.500				
Unnamed Spring	1	100	2.500				
Granite Creek	7	640	16.000	5860	(See Seven Mile Creek)		
Unnamed Spring	1	150	3.750				
Sump	0	0	0.000	5860	(See Seven Mile Creek)		
Bell & Brown Spring	2	100	2.500				
Skelly Gulch Creek	12	3,770	94.250	5860	(See Seven Mile Creek)		
E. F. Skelly Gulch Creek	3	320	8.000				
N. F. Skelly Gulch Creek	1	1,000	25.000				
Unnamed Springs	3	615	15.375				
Hamlin Creek	1	100	2.500	5860	(See Seven Mile Creek)		
Lincoln Gulch Cr.	4	100	2.500				
Spring Creek	4	2,000	50.000				
Jeff Davis Gulch Creek	4	525	13.125				
Paymaster Springs	1	25	.625				
Unnamed Springs	3	210	5.250				
St. Lewis Gulch Creek	0	0	0.000				
Spring Culch Creek	1	50	1.250				
Unnamed Spring	1	30	.750				
Park Gulch Creek	6	750	18.750	1252	1	100	2.500
Unnamed Springs	2	275	6.875				
Sheep Camp Gulch Creek	2	128	3.200				
Sage Brush Creek	1	50	1.250				
Unnamed Springs	4	110	2.750				
Unnamed Slough	1	200	5.000				
Cherry Creek	10	1,150	28.750				
Grass Valley Creek	1	150	3.750				
Lone Tree Spring	1	25	.625				
Wilson Creek	1	100	2.500				
Crystal Springs Creek	2	75	1.875				
Crystal Springs	2	350	8.750				
Stuewe Springs	2	600	15.000				
Last Chance Gulch Cr.	6	300	7.500				
Grizzly Creek	9	585	14.625				
Glenns Spring	1	5	.125				
Unnamed Springs	4	15	.375				
Unnamed Tunnel	1	3	.075				
Oro Fino Gulch Cr.	7	120	3.000	5452	1	All	——
Arastra (Keenes) Gulch Creek	5	60	1.500				
Left Fork Oro Fino Gulch Creek	1	5	.125				
Right Fork Oro Fino Gulch Creek	1	All	——				

WATER RIGHT DATA — LEWIS AND CLARK COUNTY

APPROPRIATIONS AND DECREES BY STREAMS

STREAMS	APPROPRIATIONS (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per. Sec.	DECREED RIGHTS Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
Roberta Spring	1	80	2.000				
Unnamed Drain	1	30	.750				
Unnamed Springs	4	50	1.250				
Dry Gulch Creek	10	56	1.400				
Left Fork Dry Gulch Creek	3	—	—				
Right Fork Dry Gulch Creek	2	All	—				
W. Fork Dry Gulch Creek	0	0	0.000	24156	1	All	—
Unnamed Spring	1	All	—				
Tucker Gulch Cr.	2	All	—				
Unnamed Springs	2	40	1.000				
Unnamed Springs	4	4	.100				
Waste	2	200	5.000				
Silver Creek	26	6,925	173.125	4999	21	800	20.000
Hendricks Gulch Creek	2	300	7.500				
Soft Bed Creek	1	All	—				
Unnamed Creek	1	100	2.500				
Unnamed Springs	2	26	.650				
Ottawa Gulch Creek	6	340	8.500				
Unnamed Spring	1	All	—				
Rawhide Gulch Creek	3	All	—				
South Fork Rawhide Gulch Creek	1	All	—				
Unnamed Tunnel	1	50	1.250				
Waste	1	120	3.000				
Jennies Fork Creek	3	70	1.750				
Sawmill Gulch Creek	3	400	10.000				
South Fork Sawmill Gulch Creek	1	150	3.750				
China Gulch Creek	1	10	.250				
Trust to Luck Gulch Creek	3	90	2.250				
Warren Gulch Creek	1	20	.500				
Trust to Luck Spring	1	All	—				
Mount Lookout Spring	2	35	.875				
Three Mile Creek	6	200	5.000	4999	(See Silver Creek)		
Left Fork Three Mile Creek	1	20	.500				
Calf Gulch Creek	1	40	1.000				
Mudd Springs	1	200	5.000				
Unnamed Springs	6	140	3.500				
Unnamed Well	1	200	5.000				
Smith Slough	1	50	1.250				
Unnamed Springs	2	400	10.000				
Unnamed Drain	2	700	17.500				
Buck Gulch Creek	2	140	3.500				
Diamond Springs	2	All	—				
Fouls Spring	1	All	—				
Unnamed Springs	4	110	2.750				
Noyes Embody Spring	1	All	—				
Unnamed Springs	5	810	20.250				
Unnamed Creek	1	300	7.500				
Unnamed Pond	2	200	5.000				
Unnamed Well	1	100	2.500				
Butte Springs	1	100	2.500				
Antelope Creek	4	365	9.125				
Unnamed Drain	1	40	1.000				

WATER RIGHT DATA — LEWIS AND CLARK COUNTY

APPROPRIATIONS AND DECREES BY STREAMS

STREAMS	APPROPRIATIONS (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per. Sec.	DECREED RIGHTS Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
Smith Fork Prickly Pear (Spring) Creek	4	150	3.750	5202	2	100	2.500
Lone Tree Gulch Creek	3	1,100	27.500				
English Slough	2	100	2.500				
Unnamed Springs	3	250	6.250				
Unnamed Slough	1	400	10.000				
Beaver Creek	11	5,215	130.375	16631	(See Trout Creek)		
Dry Creek	1	25	.625				
Porcupine Creek	2	125	3.125				
Unnamed Spring	1	50	1.250				
Bridge Creek	0	0	0.000				
Cottonwood Gulch Cr.	2	660	16.500				
Cottonwood Springs	1	——	——				
Hunters Creek	3	700	17.500				
Tow Head (Ming) Creek	10	2,900	72.500	6209	3	500	12.500
Fir Gulch Creek	2	250	6.250				
Unnamed Spring	1	500	12.500				
Sperry (Bear Tooth) Cr.	4	630	15.750				
Sawmill Gulch Creek	2	50	1.250				
Right Fork Sawmill Gulch Creek	1	All	——				
Unnamed Well	1	100	2.500				
Unnamed Spring	1	30	.750				
Unnamed Spring	1	5	.125				
Willow Creek	9	4,785	119.625				
Crystal Spring	1	20	.500				
Elkhorn Creek	13	15,094	377.350				
Left Fork Elkhorn Cr.	1	200	5.000				
N. Fork Elkhorn Cr.	1	100	2.500				
Right Fork Elkhorn Cr.	1	300	7.500				
Sulphur Creek	1	100	2.500				
Sun Set Creek	1	75	1.875				
Unnamed Spring	1	80	2.000				
Culbertson Creek	1	150	3.750				
Cottonwood Creek	6	5,735	143.375				
Unnamed Spring	1	10	.250				
Unnamed Creek	3	150	3.750				
Dog Coulee Creek	1	50	1.250				
Goat Coulee Creek	1	50	1.250				
Mount Peck Coulee Cr.	1	50	1.250				
Rock Spring	1	75	1.875				
Wood Gulch Creek	1	300	7.500				
Ox Bow Creek	1	150	3.750				
Log Gulch Creek	1	250	6.250				
Rose (Falls Gulch) Creek	2	800	20.000				
Timber Gulch Creek	1	——	——				
Spring Creek	4	550	13.750				
Unnamed Creek	1	240	6.000				
Little Prickly Pear Creek	35	28,180	704.500	5627	32	4,217	105.425
				14056	2	75	1.875
				4041*	1	500	12.500
North West Fork Little Prickly Pear Creek	1	All	——				
Right Fork Little Prickly Pear Creek	1	150	3.750				
North Fork Little Prickly Pear Creek	4	490	12.250				
South Fork Little Prickly Pear (Beaver) Creek	1	160	4.000	5627	(See Little Prickly Pear Cr.)		
Unnamed Springs	2	170	4.250				

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STREAMS	APPROPRIATIONS (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per. Sec.	DECREED RIGHTS Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
Deadman Creek	4	1,150	28.750	5627	(See Little Prickly Pear Cr.)		
Hot Water Spring	1	75	1.875				
Middle Fork Deadman Creek	1	500	12.500				
N. Fork Deadman Cr.	1	400	10.000				
S. Fork Deadman Cr.	3	840	21.000				
Cottonwood Creek	1	150	3.750	5627	(See Little Prickly Pear Cr.)		
Lost Horse Creek	4	400	10.000	5627	(See Little Prickly Pear Cr.)		
Spring Branch Creek	1	All	——				
Unnamed Spring	1	All	——				
Right Fork Lost Horse Creek	1	100	2.500				
Left Fork Lost Horse Creek	1	500	12.500				
Trib. of Lost Horse Creek	1	——	——				
Combs Gulch Creek	14	6,500	162.500				
South Fork Combs Gulch Creek	1	15	.375				
Whipporwill Gulch Creek	1	500	12.500				
Unnamed Spring	1	——	——				
Empire Gulch Creek	0	0	0.000				
Towsley Gulch Creek	2	250	6.250				
Unnamed Spring	1	100	2.500				
Marsh Creek	12	7,510	187.750	5627	(See Little Prickly Pear Cr.)		
Miller Creek	1	150	3.750				
Left Fork Marsh Creek	1	300	7.500				
N. Fork Marsh Creek	2	500	12.500				
Hawkins Gulch Creek	0	0	0.000				
Unnamed Spring	1	10	.250				
Unnamed Spring	1	30	.750				
Spring Creek	2	130	3.250				
Unnamed Spring	1	40	1.000				
Piegan Creek	4	650	16.250	5627	(See Little Prickly Pear Cr.)		
Drinkwater (East Fork Piegan) Creek	6	400	10.000				
N. Fork Piegan Creek	1	100	2.500				
Old Sawmill Gulch Cr.	1	150	3.750				
Right Fork Piegan Cr.	1	100	2.500				
Trib. of Piegan Creek	1	All	——				
Woodchuck Spring	1	200	5.000				
Unnamed Spring	1	75	1.875				
Deer Creek	0	0	0.000	5627	(See Little Prickly Pear Cr.)		
Meagher Gulch Creek	3	230	5.750				
Unnamed Spring	1	All	——				
Canyon Creek	26	25,186	629.650	342	1	1,760	44.000
				6263	2	828	20.700
				14127	1	50	1.250
				10729*	1	——	——
Kelly Creek	1	100	2.500				
Right Fork Canyon Cr.	1	All	——				
Road Creek	1	50	1.250				
S. W. Fork Canyon Cr.	1	All	——				
Trib. of Canyon Creek	1	——	——				
Shineburger Creek	1	150	3.750				
Little Mill Creek	1	50	1.250				
Unnamed Spring	1	60	1.500				
Virginia Creek	12	2,150	53.750				

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Kennion Creek	1	500	12.500				
N. Fork Virginia Cr.	0	0	0.000				
Silver Springs	1	20	.500				
Unnamed Springs	2	19	.475				
Homestake Gulch Creek	1	100	2.500				
Big Spring	1	20	.500				
Rooster Bill Creek	1	All	——				
Fool Hen Gulch Cr.	1	500	12.500				
Stemple Creek	1	All	——				
Goulds Creek	10	2,100	52.500	7765	4	35	.875
Hubbard Creek	1	1,000	25.000	7765	(See Goulds Creek)		
N. Fork Goulds Cr.	0	0	0.000	7765	(See Goulds Creek)		
S. Fork Goulds Cr.	2	1,000	25.000	7765	(See Goulds Creek)		
South West Fork Goulds Creek	1	200	5.000	7765	(See Goulds Creek)		
Unnamed Spring	1	300	7.500	7765	(See Goulds Creek)		
Bears Gulch Cr.	1	250	6.250	7765	(See Goulds Creek)		
Sawmill Creek	0	0	0.000	7765	(See Goulds Creek)		
Trout Creek	8	4,860	121.500				
Right Fork Trout Creek	1	600	15.000				
Mill Creek	1	500	12.500	6060	2	60	1.500
Rattlesnake Creek	8	731	18.275				
Cottonwood Creek	7	2,020	50.500				
Middle Fork Cottonwood Creek	1	150	3.750				
Gravelly Range Lake	5	14,300	357.500				
Lake Creek	3	440	11.000				
Unnamed Creek	2	100	2.500				
Trib. Cottonwood Cr.	1	80	2.000				
Sears Gulch Creek	3	400	10.000				
Unnamed Spring	1	100	2.500				
Demijohn Gulch Creek	0	0	0.000				
Unnamed Springs	1	10	.250				
Unnamed Springs	3	150	3.750				
Trinity Creek	5	55	1.375				
Spring Creek	0	0	0.000				
East Fork Spring Cr.	1	100	2.500				
Upper Willow Springs	1	All.	——				
Cayota Gulch Creek	2	100	2.500				
Unnamed Spring	1	25	.625				
Willow Creek	1	50	1.250	3193	1	All	——
Eagle Creek	2	58	1.450				
Middle Fork Willow Creek	1	100	2.500				
Long Gulch Creek	4	425	10.625				
Roberts Spring	2	375	9.375				
Unnamed Springs	2	510	12.750				
Little Sheep Creek	1	20	.500				
Big Sheep Creek	7	3,475	86.875				
Unnamed Spring	1	20	.500				
Clark Creek	1	75.	1.875				
Mitchell Gulch Creek	2	250	6.250				
Unnamed Creek	2	350	8.750				
Unnamed Spring	1	All	——				
Saw Mill Gulch Creek	1	400	10.000				
Medicine Rock Creek	1	60	1.500				
Unnamed Spring	1	40	1.000				
Lyons Creek	12	9,050	226.250				

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Bear Creek	1	100	2.500				
N. Fork Lyons Creek	1	500	12.500				
Logging Creek	1	100	2.500				
S. Fork Lyons Creek	5	1,775	44.375				
Burnt Run Creek	1	50	1.250				
Unnamed Spring	1	10	.250				
Willett Creek	1	400	10.000				
Spring Creek	2	12	.300				
Sheep Creek	6	3,150	78.750				
Glen Marie Creek	1	50	1.250				
Spring Creek	1	40	1.000				
Little Creek	3	700	17.500				
Shaw Spring	1	100	2.500				
Wolf Creek	7	4,400	110.000				
Woods Coulee Creek	1	50	1.250				
Allen Creek	0	0	0.000				
Pine Creek	1	40	1.000				
Unnamed Spring	1	120	3.000				
French Creek	3	45	1.125				
Spring Creek	2	200	5.000				
Rockie (Carter) Creek	2	200	5.000				
Lemline Springs	1	75	1.875				
Unnamed Springs	2	20	.500				
Long Gulch Creek	1	150	3.750				
School House Coulee Cr.	1	75	1.875				
Unnamed Creek	1	All	——				
Rock Creek	4	460	11.500				
Right Fork Rock Creek	1	250	6.250				
Spring Creek	1	500	12.500				
Wells Fork Rock Creek	1	75	1.875				
Unnamed Springs	2	150	3.750				
Johnson Creek	2	140	3.500				
Willis Creek	2	250	6.250				
Butcher Spring	1	50	1.250				
Evans Creek	1	50	1.250				
Unnamed Spring	1	40	1.000				
Huff Creek	1	100	2.500				
North Fork Rock Creek	1	200	5.000				
Butcher Creek	1	30	.750				
La Rock Springs	1	30	.750				
Unnamed Spring	1	30	.750				
Unnamed Creek	2	80	2.000				
Dog Creek	8	5,255	131.375				
Gap Creek	1	50	1.250				
North Fork Dog Creek	1	100	2.500				
Unnamed Spring	1	All	——				
Colburn Creek	1	50	1.250				
Spring Creek	1	160	4.000				
Unnamed Spring	1	50	1.250				
Wegner Creek	2	500	12.500	10287	5	815	20.375
Unnamed Spring	1	50	1.250				
Rocky Fork Creek	0	0	0.000	10287	(See Wegner Creek)		
Spring Creek	1	40	1.000	10287	(See Wegner Creek)		
Stickney Creek	5	1,700	42.500				
N. Fork Stickney Creek	1	100	2.500				
Fall Creek	3	380	9.500				
Peters Spring	1	All	——				
Dearborn River	21	334,533	8,363.325	7608*	(See Flat Creek)		
N. Fork Dearborn River	11	51,450	1,286.250				
Grizzly Creek	2	1,250	31.250				

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Grizzly Creek Springs	1	200	5.000				
Joslin Creek	1	300	7.500				
Unnamed Creek	1	200	5.000				
Cascade Creek	1	100	2.500				
Falls Creek	4	31,200	780.000				
Dry Wolf Creek	1	1,500	37.500				
Canyon Brook	1	500	12.500				
Lime Kiln Spring	1	200	5.000				
Unnamed Creek	1	200	5.000				
Unnamed Spring	1	600	15.000				
Clemons Creek	5	1,887	47.175				
Unnamed Spring	1	20	.500				
Unnamed Spring	1	300	7.500				
Poplar Creek	1	500	12.500				
Summit Lake	2	1,000	25.000				
Spring Lake	1	100	2.500				
Spring Creek	1	20	.500				
Unnamed Springs	2	130	3.250				
Cunniff Creek	6	1,230	30.750				
S. Fork Cunniff Cr.	1	300	7.500				
Unnamed Springs	2	75	1.875				
McClain Creek	3	350	8.750				
McDonough Creek	1	100	2.500				
Unnamed Springs	2	225	5.625				
Unnamed Spring	1	50	1.250				
Unnamed Creek	1	75	1.875				
Unnamed Slough	1	100	2.500				
Middle Fork Dearborn River	6	2,000	50.000				
Indian Creek	2	470	11.750				
Unnamed Spring	1	450	11.250				
Green Creek	5	1,190	29.750				
Bed Rock Creek	4	1,150	28.750				
South West Fork Bed Rock Creek	1	100	2.500				
Wolf Breed Creek	1	100	2.500				
Spring Creek	1	40	1.000				
Hardgrove Creek	3	300	7.500				
Unnamed Spring	1	75	1.875				
Spring Gulch Creek	1	50	1.250				
Skunk Creek	10	1,745	43.625				
Little (South Fork) Skunk Creek	5	770	19.250				
Unnamed Spring	1	25	.625				
Krone Creek	2	50	1.250				
Berry Creek	1	120	3.000				
S. Fork Dearborn River	9	3,250	81.250				
Unnamed Creek	2	160	4.000				
West Fork of South Fork Dearborn River	1	75	1.875				
Sawmill Creek	1	100	2.500				
Roberts Creek	0	0	0.000				
Spring Creek	2	200	5.000				
Unnamed Spring	1	100	2.500				
Johnson Creek	3	270	6.750				
Dry Pole Patch Creek	1	100	2.500				
Bessette Creek	1	100	2.500				
Borrell (Lime Kiln Mtn.) Creek	3	300	7.500				

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Unnamed Spring	1	50	1.250				
Russel (Pruden) Creek	1	150	3.750				
Unnamed Springs	5	250	6.250				
Jeffries Creek	2	300	7.500				
Unnamed Springs	4	226	5.650				
Auchard Creek	6	1,375	34.375				
Unnamed Spring	1	20	.500				
Gillette Creek	1	200	5.000				
Willow Coulee Creek	1	25	.625				
Spring Coulee Creek	1	25	.625				
Unnamed Spring	1	50	1.250				
Unnamed Spring	2	125	3.125				
Unnamed Creek	1	15	.375				
Unnamed Spring	1	All	——				
Coal Mine Gulch	1	50	1.250				
Unnamed Spring	1	40	1.000				
Unnamed Slough	1	300	7.500				
Dead Man Creek	4	560	14.000				
Four Mile Coulee Creek	2	280	7.000				
Flat Creek	20	8,250	206.250	7608	15	3,345	83.625
North Fork Flat Creek	3	700	17.500				
Unnamed Spring	1	50	1.250				
Unnamed Lake	1	1,000	25.000				
Unnamed Spring	1	100	2.500				
Unnamed Creek	0	0	0.000	7608	(See Flat Creek)		
Unnamed Spring	1	50	1.250				
Unnamed Springs	4	31	.775				
Unnamed Creek	1	100	2.500				
Hogan Creek	6	850	21.250	7608	(See Flat Creek)		
Unnamed Spring	1	300	7.500				
Black Rock Creek	2	1,300	32.500				
Myles Creek	1	480	12.000				
Unnamed Spring	1	10	.250				
Henry Creek	0	0	0.000				
Sheep Creek	2	200	5.000				
Unnamed Springs	8	110	2.750				
Willow Creek	1	500	12.500	7608	(See Flat Creek)		
Long Coulee Creek	5	1,530	38.250				
Unnamed Creek	2	420	10.500				
Slew Creek	1	200	5.000	7608	(See Flat Creek)		
Trib. of Flat Creek	0	0	0.000	7608	(See Flat Creek)		
Twin Bridge Coulee Cr.	1	100	2.500				
Hultin Gulch Creek	1	100	2.500				
Sun River	10	86,900	2,172.500	4742[6]	156	19,511	487.775
North Fork Sun River	3	110,600	2,765.000	4742	(See Sun River)		
Unnamed Spring	1	40	1.000				
Unnamed Well	1	5	.125				
Unnamed Spring	1	10	.250				
Buttolph Creek	2	200	5.000	4742	(See Sun River)		
Unnamed Spring	1	25	.625				
Willow Creek	16	12,125	303.125	4742	(See Sun River)		
McCarthy Creek	1	100	2.500				
Schaffer Creek	1	50	1.250				
Hudson Creek	1	40	1.000				
Half Breed (Breed) Creek	1	200	5.000	4742	(See Sun River)		
Anderson Lake	2	300	7.500				
Beale Spring	1	10	.250				
Little Willow Creek	11	4,920	123.000	4742	(See Sun River)		
Cut Rock Creek	3	225	5.625	4742	(See Sun River)		

WATER RIGHT DATA — LEWIS AND CLARK COUNTY

APPROPRIATIONS AND DECREES BY STREAMS

STREAMS	APPROPRIATIONS (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per. Sec.	DECREED RIGHTS Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
Unnamed Spring	0	0	0.000	4742	(See Sun River)		
Unnamed Creek	1	100	2.500	4742	(See Sun River)		
McGuire Creek	1	200	5.000				
Unnamed Well	1	300	7.500				
Barr Creek	3	920	23.000	4742	(See Sun River)		
N. Fork Barr Cr.	1	100	2.500				
Unnamed Lake	1	160	4.000				
Rose (Furman) Creek	2	260	6.500	4742	(See Sun River)		
West Fork Barr Creek	1	200	5.000				
Unnamed Spring	1	150	3.750				
Unnamed Spring	1	150	3.750	4742	(See Sun River)		
South Fork Sun River	27	112,640	2,816.000	4742	(See Sun River)		
Smith Creek	9	87,900	2,197.500	4742	(See Sun River)		
Larance Creek	1	50	1.250				
Ford Creek	7	9,950	248.750	4742	(See Sun River)		
Laundre Creek	1	200	5.000				
Walker Creek	1	100	2.500				
Duval Creek	1	75	1.875	4742	(See Sun River)		
Beaches Coulee Spring	2	75	1.875				
Haystack Butte Spring	2	150	3.750				
Iron Spring	1	50	1.250				
Pine Coulee Spring	1	50	1.250				
Sulphur Spring	1	50	1.250				
Summit Spring	1	100	2.500				
Smith Lake	1	250	6.250	4742	(See Sun River)		
Elk (Du Bray) Creek	14	4,860	121.500	4742	(See Sun River)		
Big Spring	1	100	2.500				
Elk Creek Spring	1	40	1.000				
Unnamed Spring	1	4,000	100.000				
Unnamed Creek	1	288	7.200				
Sheep Mountain Cr.	1	100	2.500				
Unnamed Spring	1	All	——				
Hay Coulee Creek	0	0	0.000	4742	(See Sun River)		
Coulis Creek	1	160	4.000				
Crains Creek	2	150	3.750				
Unnamed Creek	1	500	12.500				
Blubber Creek	1	50	1.250				
Goss (Frank Goss) Creek	2	475	11.875	4742	(See Sun River)		
West Creek	2	150	3.750	4742	(See Sun River)		
Haystack Butte Cr.	2	250	6.250				
W. Fork Haystack Butte Cr.	1	1,000	25.000				
Unnamed Lakes	1	320	8.000				
Unnamed Springs	2	50	1.250				
Unnamed Drain	2	320	8.000				
Unnamed Creek	1	80	2.000				
Lemon Springs	1	200	5.000				
Spring Coulee Creek	8	9,085	227.125				
Unnamed Springs	2	22	.550				
Dry Creek	13	3,330	83.250	4742	(See Sun River)		
South Fork Dry Creek	1	50	1.250				
Unnamed Lake	2	160	4.000				
West Fork Dry Creek	1	50	1.250				

WATER RIGHT DATA — LEWIS AND CLARK COUNTY

APPROPRIATIONS AND DECREES BY STREAMS

STREAMS	APPROPRIATIONS (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per. Sec.	DECREED RIGHTS Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
School Spring Coulee Creek	1	100	2.500				
Unnamed Spring	1	50	1.250				
Rock Camp Creek	3	450	11.250	4742	(See Sun River)		
Unnamed Creek	2	350	8.750				
Unnamed Springs	3	50	1.250				
Unnamed Creek	0	0	0.000	4742	(See Sun River)		
Cooper Creek	2	100	2.500				
Unnamed Spring	1	200	5.000				
Sheep Creek	3	350	8.750				
Little Dry Creek	1	25	.625				
Unnamed Creek	1	All	——				
Simms (Spring) Creek	3	650	16.250				
Tree Claim Creek	1	200	5.000				
Benjamin Creek	2	130	3.250				
Unnamed Spring	1	40	1.000				
Valentine Creek	1	80	2.000				
Davis Creek	1	2	.050				
North Fork Simms Cr.	1	400	10.000				
Unnamed Spring	1	10	.250				
Johnstone Creek	1	150	3.750				
TOTAL	1,754	11,701,804	292,545.100		400	49.526.5	1,238.163

[1] This decree is recorded and filed in Lewis and Clark County. It applies to both Lewis and Clark and Broadwater Counties.

[2] This decree is recorded and filed in Jefferson County. It applies to both Lewis and Clark and Broadwater Counties.

[3] This decree is recorded and filed in the Federal Courthouse at Helena. It applies to both Lewis and Clark and Jefferson Counties.

[4] This decree is recorded and filed in the District Courthouse at Helena. It applies to both Lewis and Clark and Jefferson Counties.

[5] One right for 600 inches from the Dearborn River is carried in the Flat Creek Decree. However, the Dearborn River is not adjudicated.

[6] This decree is recorded and filed in Cascade County. It applies to Lewsi and Clark, Cascade, and Teton Counties.

* Ditch Decrees.

WATER RIGHT DATA — LEWIS AND CLARK COUNTY

APPROPRIATIONS AND DECREES BY STREAMS

STREAMS	APPROPRIATIONS (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per. Sec.	DECREED RIGHTS Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
COLUMBIA RIVER BASIN							
Clark Fork of Columbia (Missoula) (Hellgate) **River**	0	0	0.000				
Little Blackfoot River	0	0	0.000				
North Fork Little Blackfoot River	2	450	11.250				
Uncle George Gulch Creek	2	750	18.750				
Unnamed Spring	1	50	1.250				
Dog Creek	15	5,630	140.750				
Jackson Gulch Creek	1	All	——				
Left Fork Dog Creek	1	15	.375				
American Creek	14	2,680	67.000				
La Salle Gulch Cr.	1	150	3.750				
Meadow Creek	7	3,600	90.000				
East Fork Meadow Creek	1	30	.750				
Slaughterhouse Gulch Creek	1	30	.750				
Hope Creek	18	3,275	81.875				
Hope Gulch Spring	2	100	2.500				
Unnamed Creek	1	30	.750				
Spring Gulch Cr.	3	362	9.050				
Faith Gulch Creek	2	100	2.500				
Big Spring	1	100	2.500				
Unnamed Springs	2	20	.500				
Snowshoe Creek	2	All	——				
Unnamed Creek	1	All	——				
Ophir Gulch Creek	3	650	16.250				
Cayuse Gulch Creek	1	100	2.500				
East Fork Ophir Gulch Creek	1	All	——				
Left Fork Ophir Gulch Creek	2	400	10.000				
Unnamed Spring	1	75	1.875				
Unnamed Spring	1	75	1.875				
Blackfoot River	19	22,700	567.500				
Anaconda Creek	2	100	2.500				
Teepee Lodge Creek	1	300	7.500				
Mike Horse Creek	1	10	.250				
Bear Trap Creek	4	170	4.250				
Shoue Gulch Creek	2	750	18.750				
N. Fork Shoue Gulch Creek	1	40	1.000				
Pass Creek	1	300	7.500				
Unnamed Spring	1	All	——				
Cadotte Creek	2	280	7.000				
Willow Creek	0	0	0.000				
Jones Creek	1	30	.750				
Trail Creek	1	150	3.750				
Sanborn Creek	1	150	3.750				
E. Fork Sanborn Cr.	1	200	5.000				
W. Fork Sanborn Cr.	1	100	2.500				
Huckleberry Creek	1	100	2.500				
Alice Creek	5	5,500	137.500				
Toms Creek	1	500	12.500				
Lizzie Creek	1	500	12.500				
Spring Creek	1	500	12.500				
Horsefly Creek	1	160	4.000				
Hogem Creek	4	850	21.250				

WATER RIGHT DATA — LEWIS AND CLARK COUNTY

APPROPRIATIONS AND DECREES BY STREAMS

STREAMS	APPROPRIATIONS (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per. Sec.	DECREED RIGHTS Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
Right Fork Hogem Creek	1	100	2.500				
Black Diamond Creek	1	40	1.000				
Landers Fork Blackfoot River	4	6,700	167.500				
Indian Meadow Creek	1	2,000	50.000				
Copper Creek	7	76,000	1,900.000				
Seven Up Pete Creek	6	1,450	36.250				
Camp Spring	1	10	.250				
Donnelly Spring	1	15	.375				
Erickson Spring	2	27	.675				
Mountain Trout Creek	2	350	8.750				
North Fork Seven Up Pete Creek	3	120	3.000				
South Fork Seven Up Pete Creek	5	230	5.750				
Watts Spring	1	15	.375				
Wulff Spring	1	15	.375				
Unnamed Springs	2	405	10.125				
Dannen Creek	1	1,000	25.000				
Poor Mans Creek	17	10,934	273.350				
Evans Creek	1	300	7.500				
Right Fork Poor Mans Creek	1	60	1.500				
Swamp Creek	2	80	2.000				
North Fork Poor Mans Creek	4	1,365	34.125				
Silver Bell Creek	2	280	7.000				
S. Fork Poor Mans Cr.	14	2,130	53.250				
Junction Gulch Creek	1	500	12.500				
Rodchester Creek	2	400	10.000				
McClellan Creek	1	1,000	25.000				
Unnamed Spring	1	40	1.000				
Crevice Creek	5	675	16.875				
Unnamed Spring	1	—	—				
Fields Gulch Creek	1	300	7.500				
Humbug Creek	5	850	21.250				
Dallas Spring	1	All	—				
Sharps Spring	1	144	3.600				
Duck Creek	1	All	—				
Spring Creek	1	1,400	35.000				
Keep Cool Creek	8	2,800	70.000	10475	1	500	12.500
Branch Keep Cool Cr.	1	50	1.250				
Sucker Creek	3	1,500	37.500				
Mill Creek	1	30	.750				
Liverpool Creek	2	800	20.000				
Stonewall Creek	10	1,920	48.000	11517	1	200	5.000
Unnamed Springs	2	70	1.750				
Spring Creek	1	150	3.750				
Park Creek	1	200	5.000				
Little Beaver Creek	1	288	7.200				
Beaver Creek	4	3,500	87.500				
Spring Creek	5	3,480	87.000				
Little Spring Creek	1	300	7.500				
Lincoln Creek	4	1,100	27.500	5389	4	680	17.000
Feeder Springs	1	12	.300				
North Springs	1	80	2.000				
South Springs	1	80	2.000				
Unnamed Spring	1	3	.075				
Clear Creek	3	28,200	705.000	5389	(See Lincoln Creek)		

WATER RIGHT DATA — LEWIS AND CLARK COUNTY
APPROPRIATIONS AND DECREES BY STREAMS

STREAMS	APPROPRIATIONS (Filings of Record) No. of Filings	Miner's Inches	Cu. Ft. Per. Sec.	DECREED RIGHTS Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
East Spring	1	1,000	25.000				
West Spring	1	1,000	25.000				
Willow Creek	7	1,440	36.000				
W. Fork Willow Creek	1	200	5.000				
Bear Creek	3	1,200	30.000				
Sauerkraut Creek	6	3,000	75.000				
Fountain Gulch Creek	1	50	1.250				
Willy Miller Creek	1	50	1.250				
Center Gulch Creek	1	50	1.250				
N. Fork Blackfoot Riveer	2	80,000	2,000.000				
Klondike Creek	1	80	2.000				
Nevada Creek	0	0	0.000				
Jefferson Creek	1	200	5.000				
Unnamed Spring	1	40	1.000				
Madison Creek	5	160	4.000				
Unnamed Lakes	1	—	—				
Buffalo Gulch Creek	2	150	3.750				
Flathead River	0	0	0.000				
S. Fork Flathead River	0	0	0.000				
Danaher Creek	0	0	0.000				
Barr Creek	2	360	9.000				
TOTAL	329	294,540	7,363.500		6	1,380	34.500

WATER RIGHT DATA — LEWIS AND CLARK COUNTY
APPROPRIATIONS AND DECREES BY STREAMS

STREAMS	No. of Filings	Miner's Inches	Cu. Ft. Per. Sec.
DRAINAGES IN LEWIS AND CLARK COUNTY NOT LOCATED			
Bingsas Creek	1	200	5.000
French Gulch Creek	1	60	1.500
Friday Gulch Creek	1	25	.625
Hamilton Creek	1	All	—
Hanson Creek	1	500	12.500
Murray Gulch Creek	1	100	2.500
Rock Canyon Creek	1	150	3.750
Seymour Gulch Creek	2	70	1.750
Spring Creeks	4	245	6.125
Unnamed Creeks	19	1,710	42.750
Sarvasin Spring	1	1	.025
Unnamed Springs	41	2,952	73.800
Unnamed Tunnel	1	5	.125
Waste	8	295	7.375
TOTAL	83	6,313	157.825

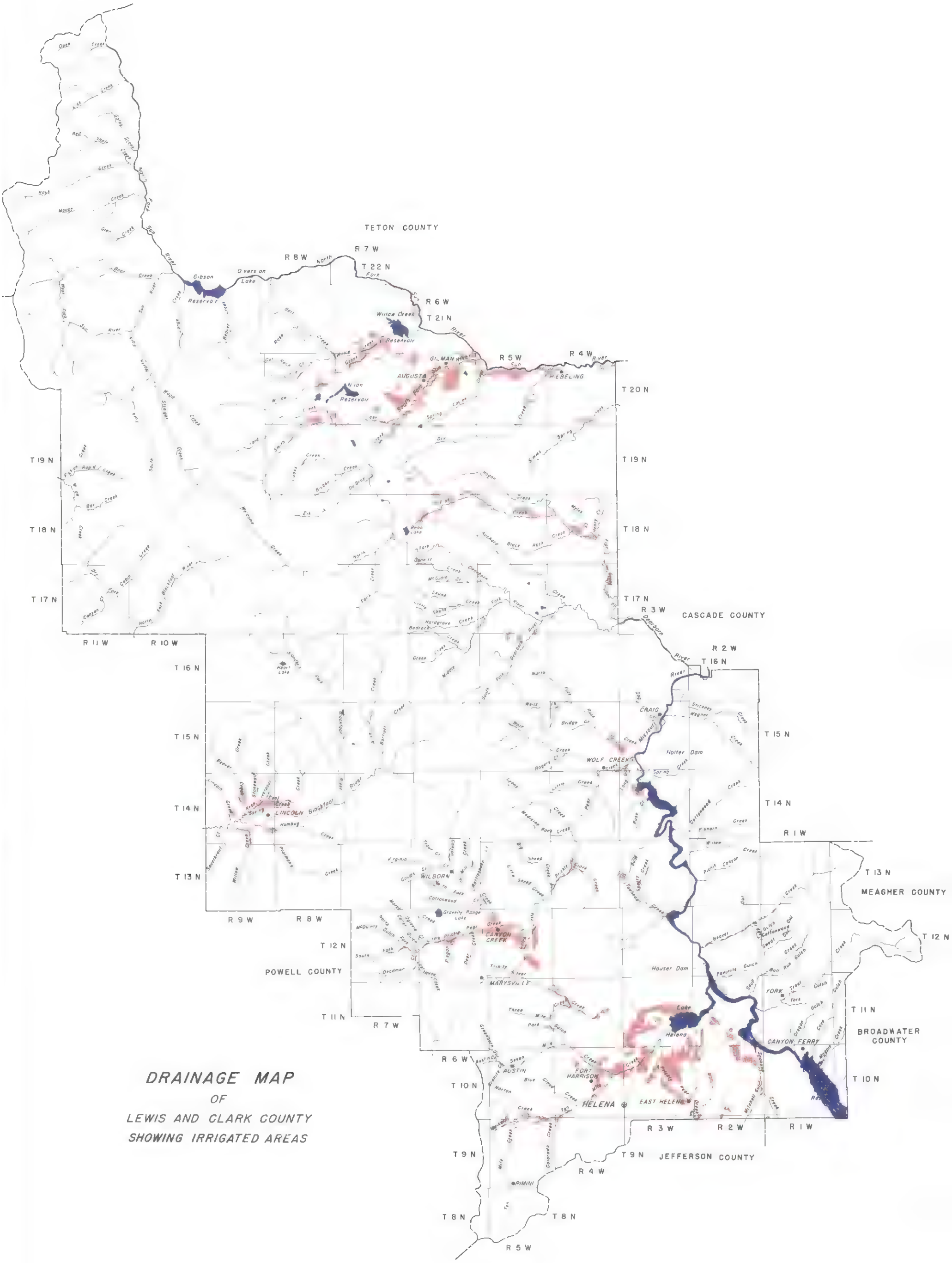
WATER RESOURCES SURVEY

Lewis and Clark County, Montana

PART II

Maps Showing Irrigated Areas

Published by
STATE ENGINEER'S OFFICE
Helena, Montana
June, 1957
Reprinted as of June, 1965



DRAINAGE MAP

OF

LEWIS AND CLARK COUNTY

SHOWING IRRIGATED AREAS

MAP INDEX

MAP SYMBOL INDEX

BOUNDARIES

- COUNTY LINE
- NATIONAL FOREST LINE

DITCHES

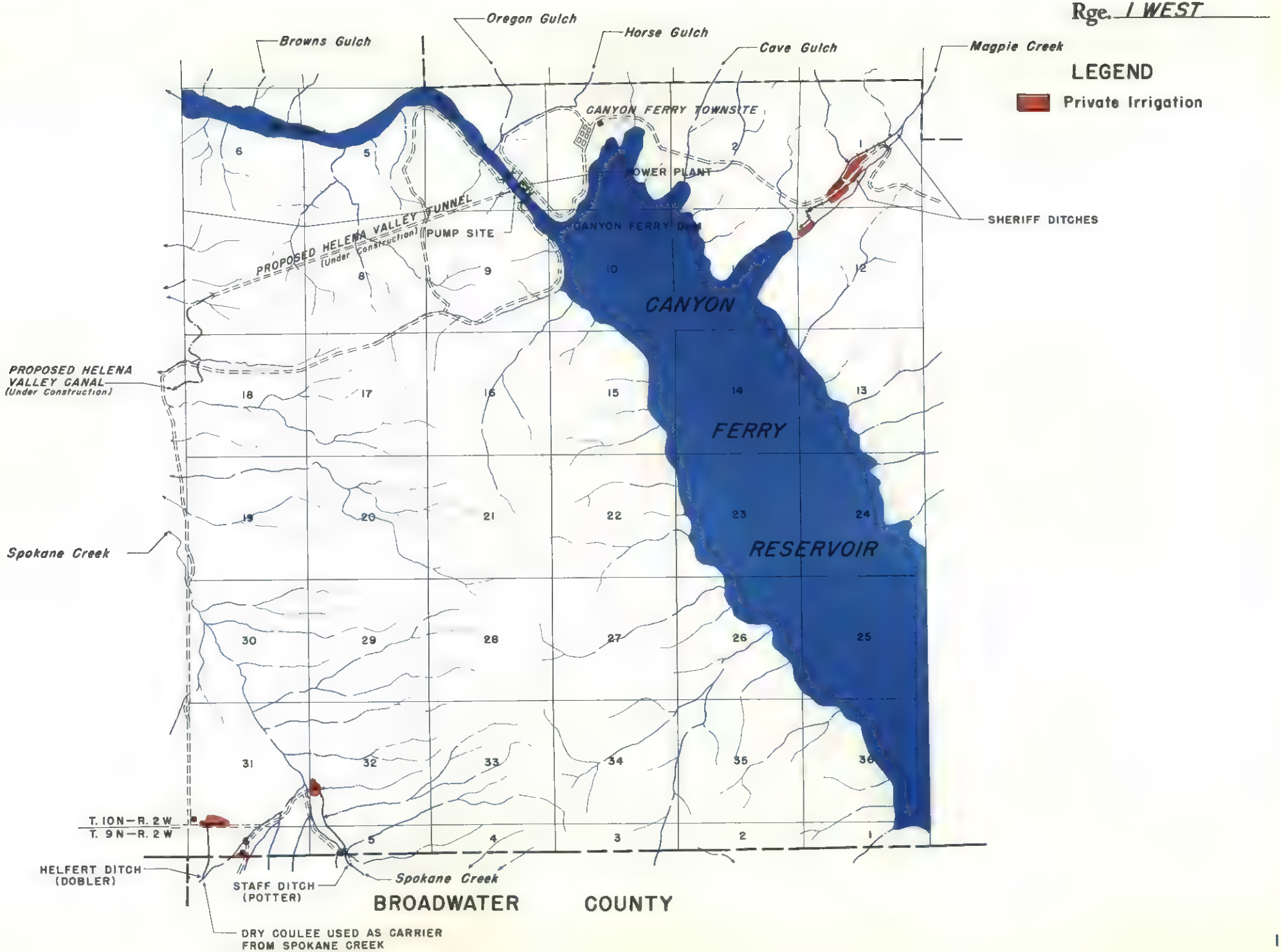
- CANALS OR DITCHES
- DRAIN DITCHES
- PROPOSED DITCHES

TRANSPORTATION

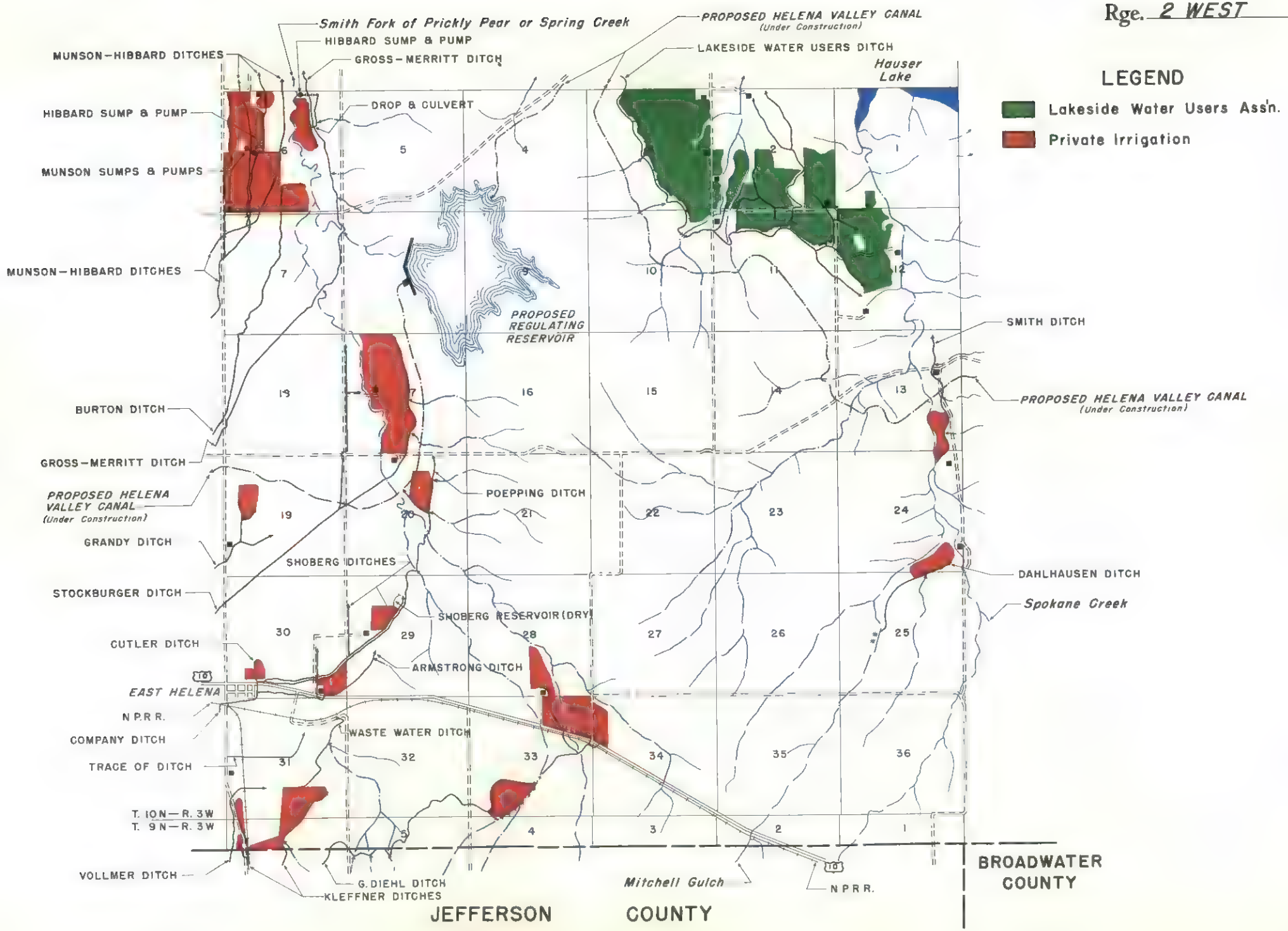
- PAVED ROADS
- UNPAVED ROADS
- RAILROADS
- STATE HIGHWAY
- U.S. HIGHWAY
- AIRPORT

STRUCTURES & UNITS

- DAM
- DIKE
- FLUME
- SIPHON
- SPILL
- SPRINKLER SYSTEM
- WEIR
- PIPE LINE
- PUMP
- PUMP SITE
- RESERVOIR
- WELL
- NATURAL CARRIER USED AS DITCH
- SPRING
- SWAMP
- GAUGING STATION
- POWER PLANT
- STORAGE TANK
- CEMETERY
- FAIRGROUND
- FARM OR RANCH UNIT
- LOOKOUT STATION
- RANGER STATION
- RAILROAD TUNNEL
- SCHOOL
- SHAFT, MINE, OR DRIFT


Twp. 10 NORTH
Rge. 1 WEST
Browns Gulch
Oregon Gulch
Horse Gulch
Cave Gulch
Magpie Creek
LEGEND
Private Irrigation
CANYON FERRY TOWNSITE
POWER PLANT
SHERIFF DITCHES
PROPOSED HELENA VALLEY TUNNEL (Under Construction)
PUMP SITE
CANYON FERRY DAM
CANYON
FERRY
RESERVOIR
PROPOSED HELENA VALLEY CANAL (Under Construction)
Spokane Creek
T. 10N—R. 2W.
T. 9N—R. 2W.
HELFERT DITCH (DOBLER)
STAFF DITCH (POTTER)
Spokane Creek
BROADWATER COUNTY
DRY COULEE USED AS CARRIER FROM SPOKANE CREEK

Twp. 10 NORTH
Rge. 2 WEST



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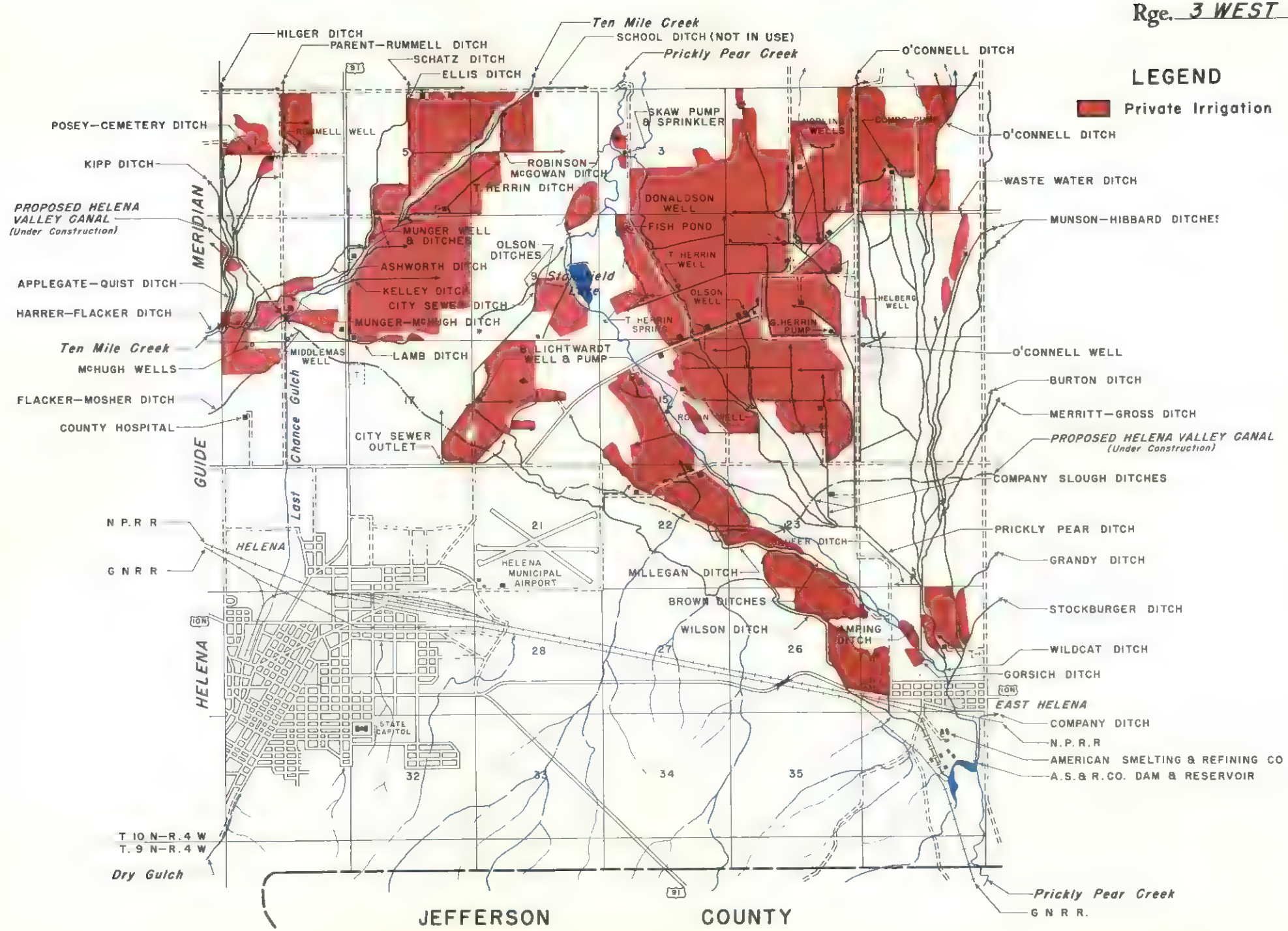
Rge. 3 WEST



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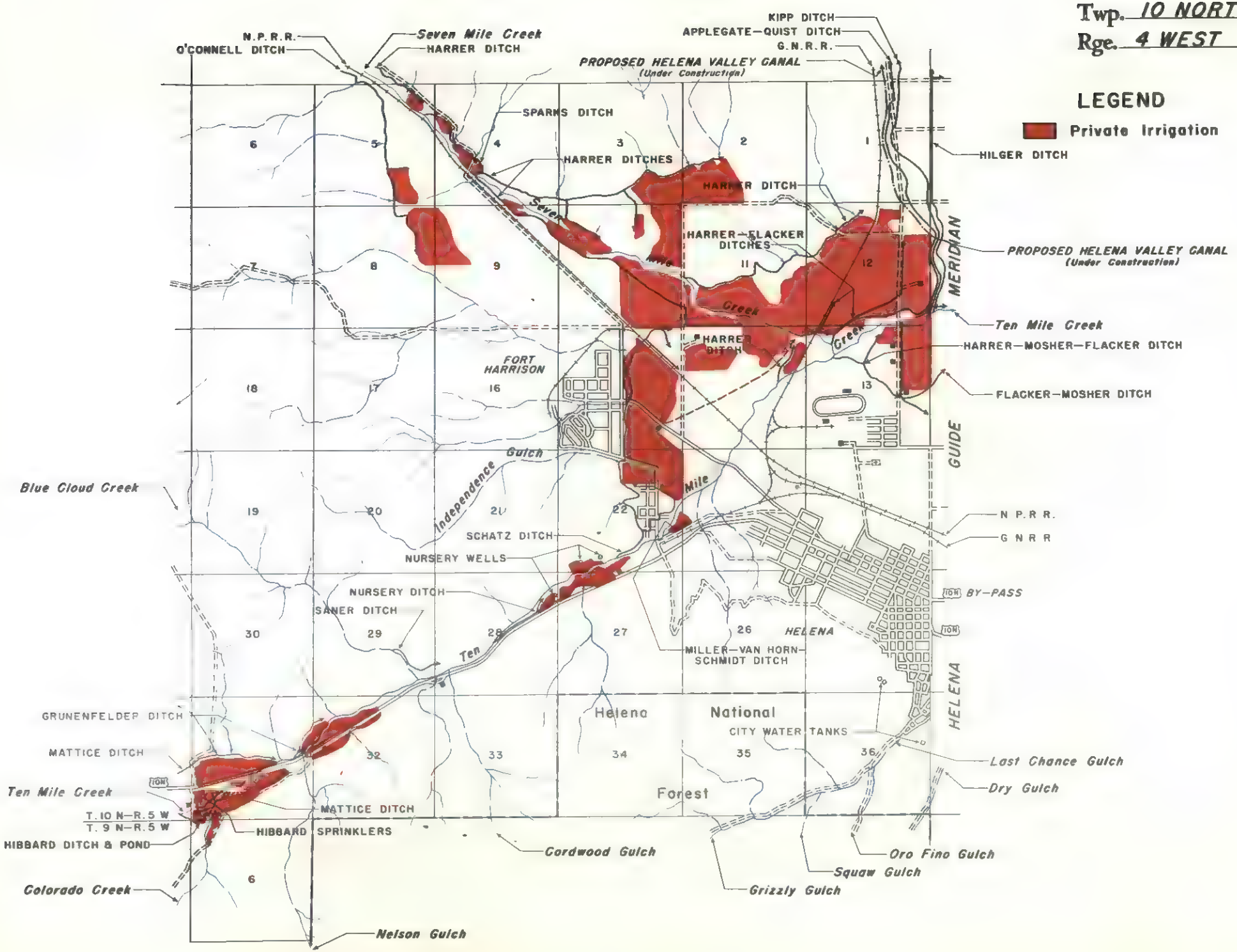
Rge. 4 WEST



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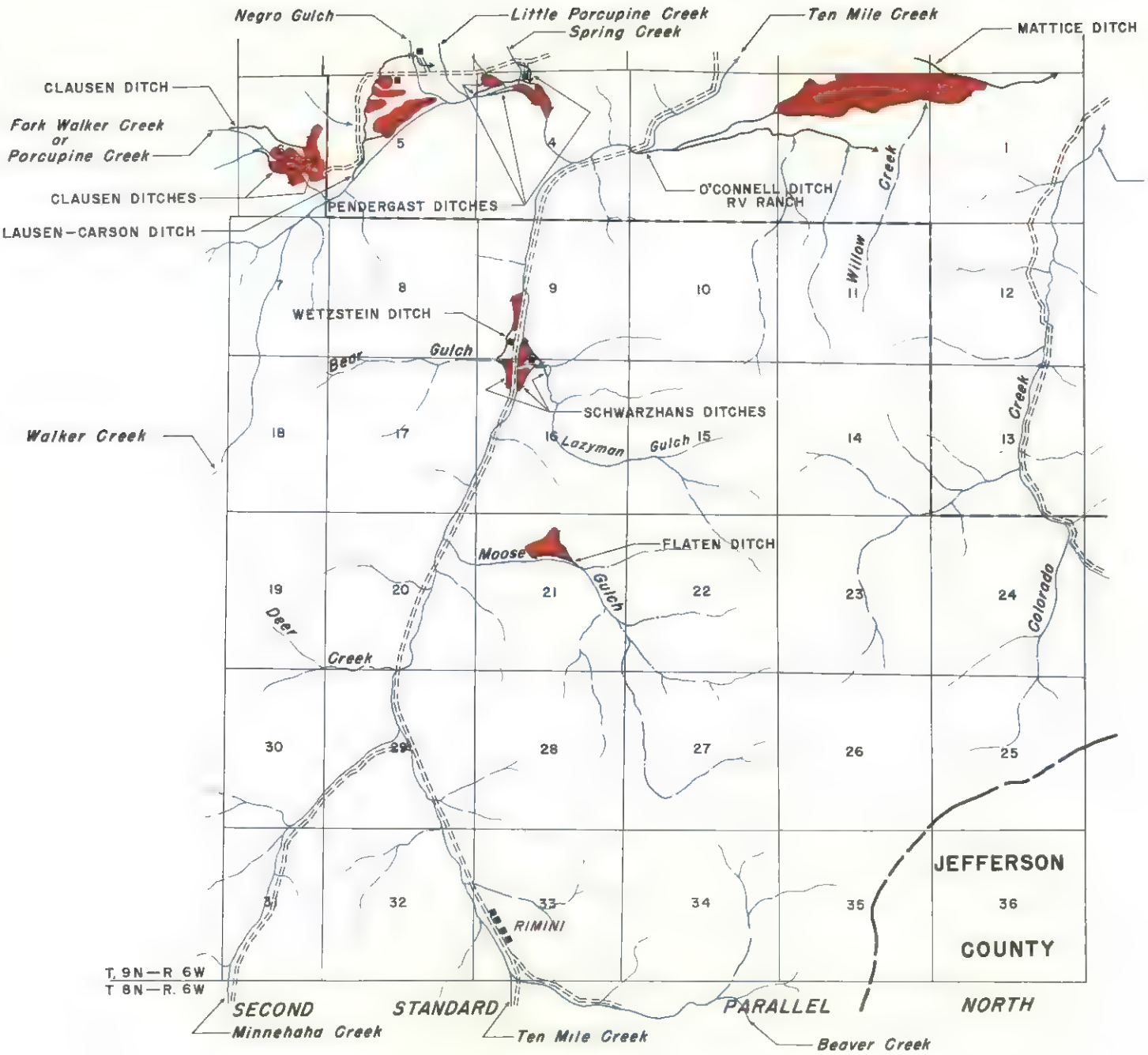
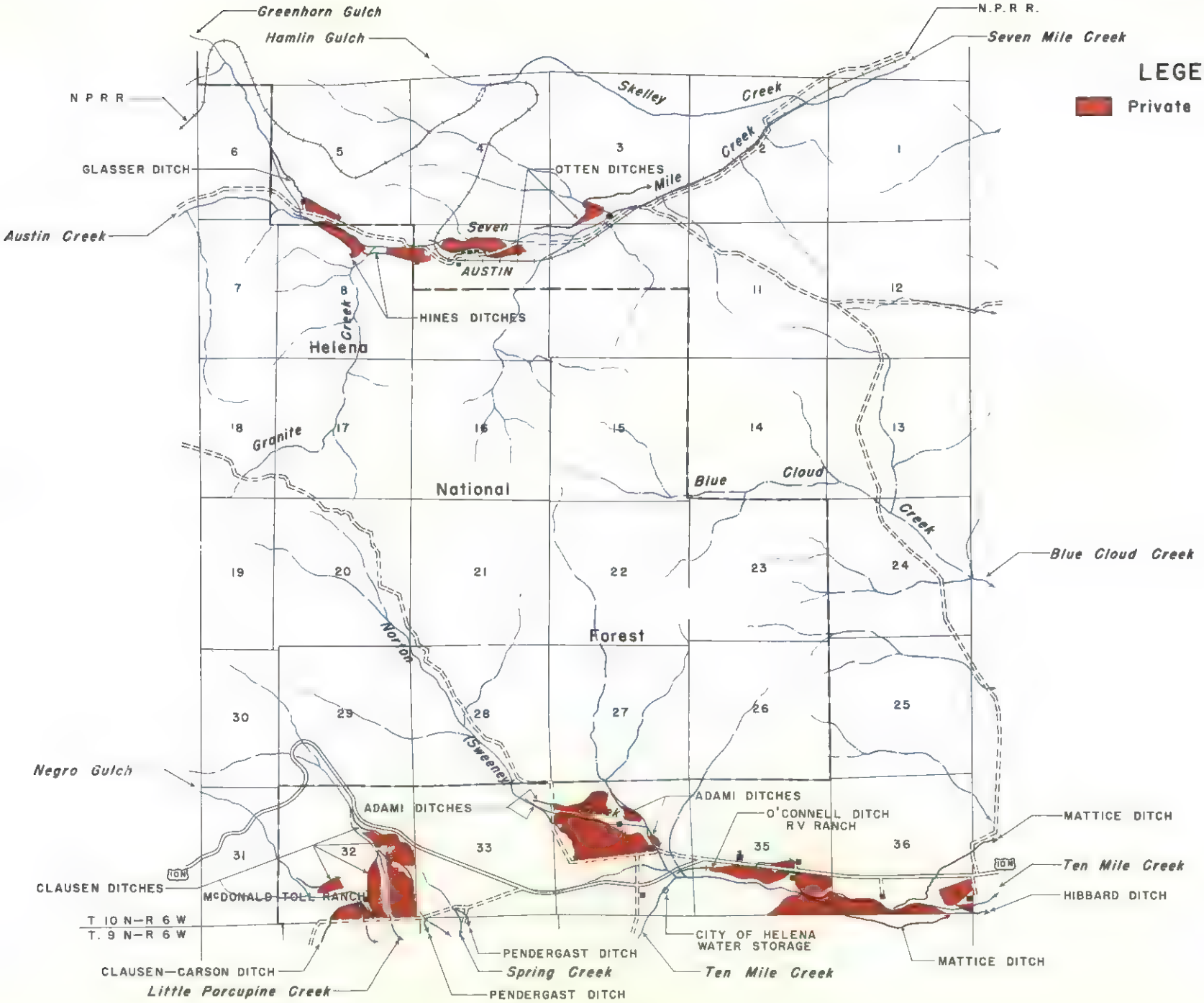
Rge. 5 WEST



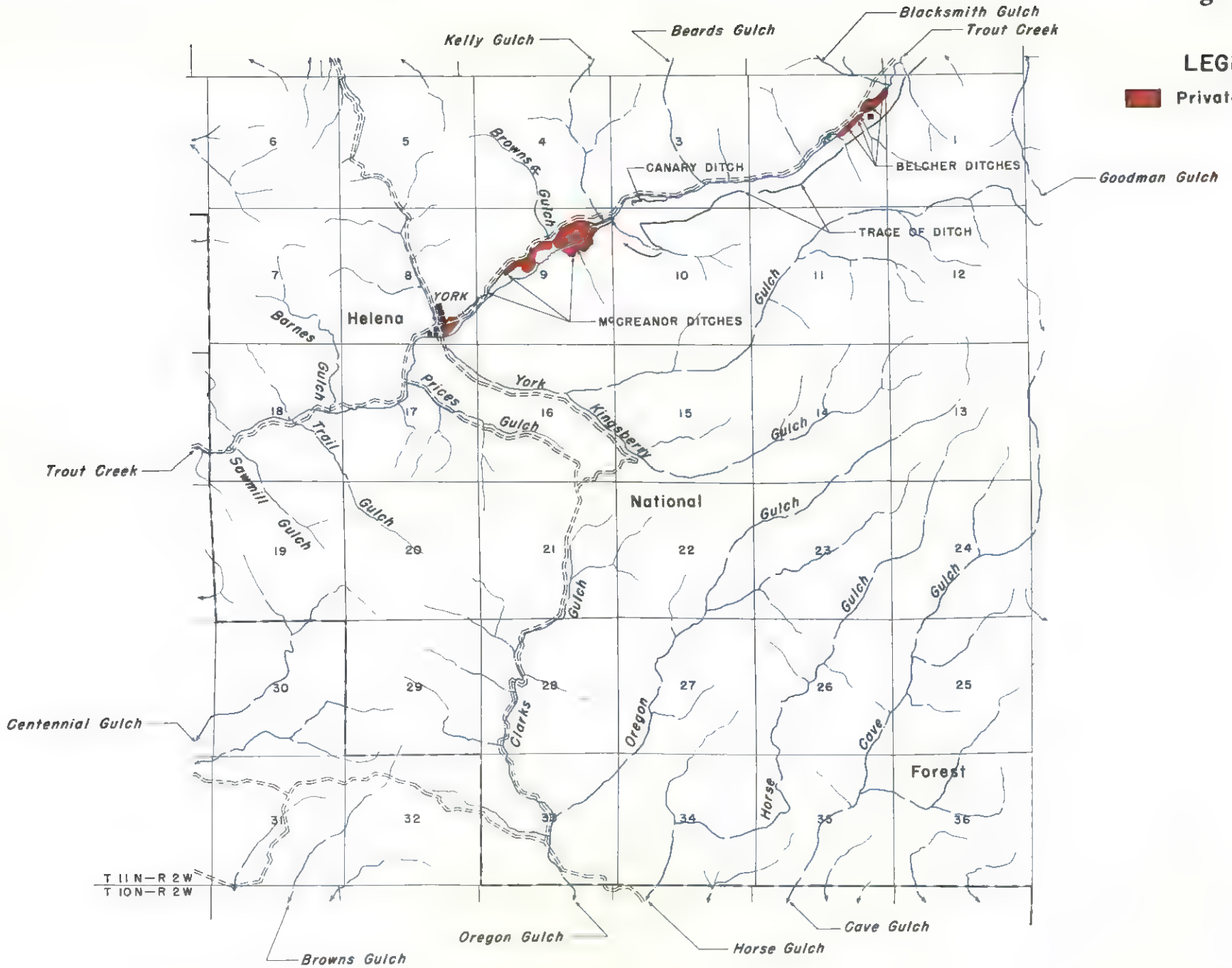
LEGEND

Private Irrigation

Twp. 10 NORTH
Rge. 5 WEST



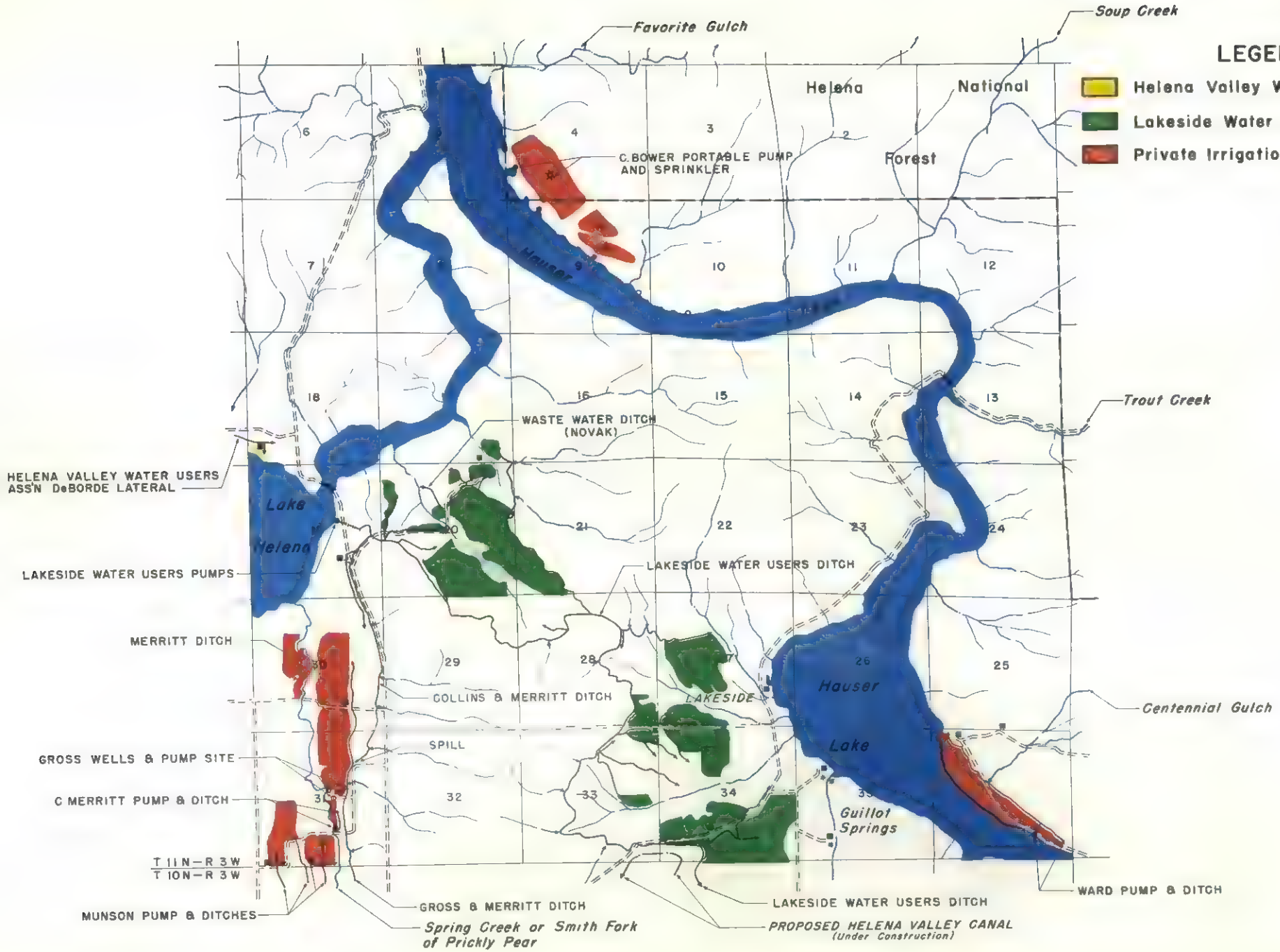
Twp. 11 NORTH
Rge. 1 WEST



LEGEND

Private Irrigation

Twp. 11 NORTH
Rge. 2 WEST



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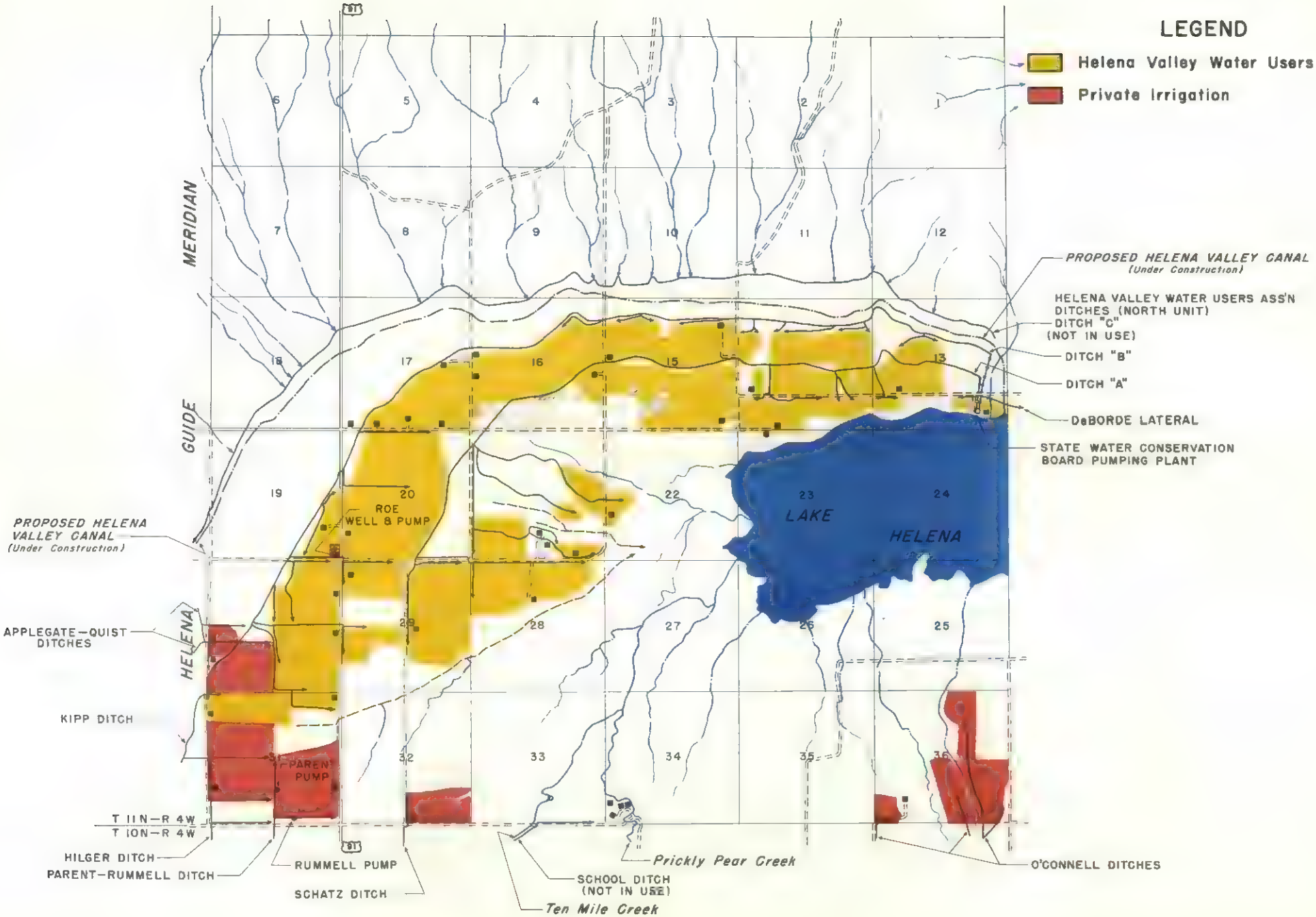
Rge. 3 WEST



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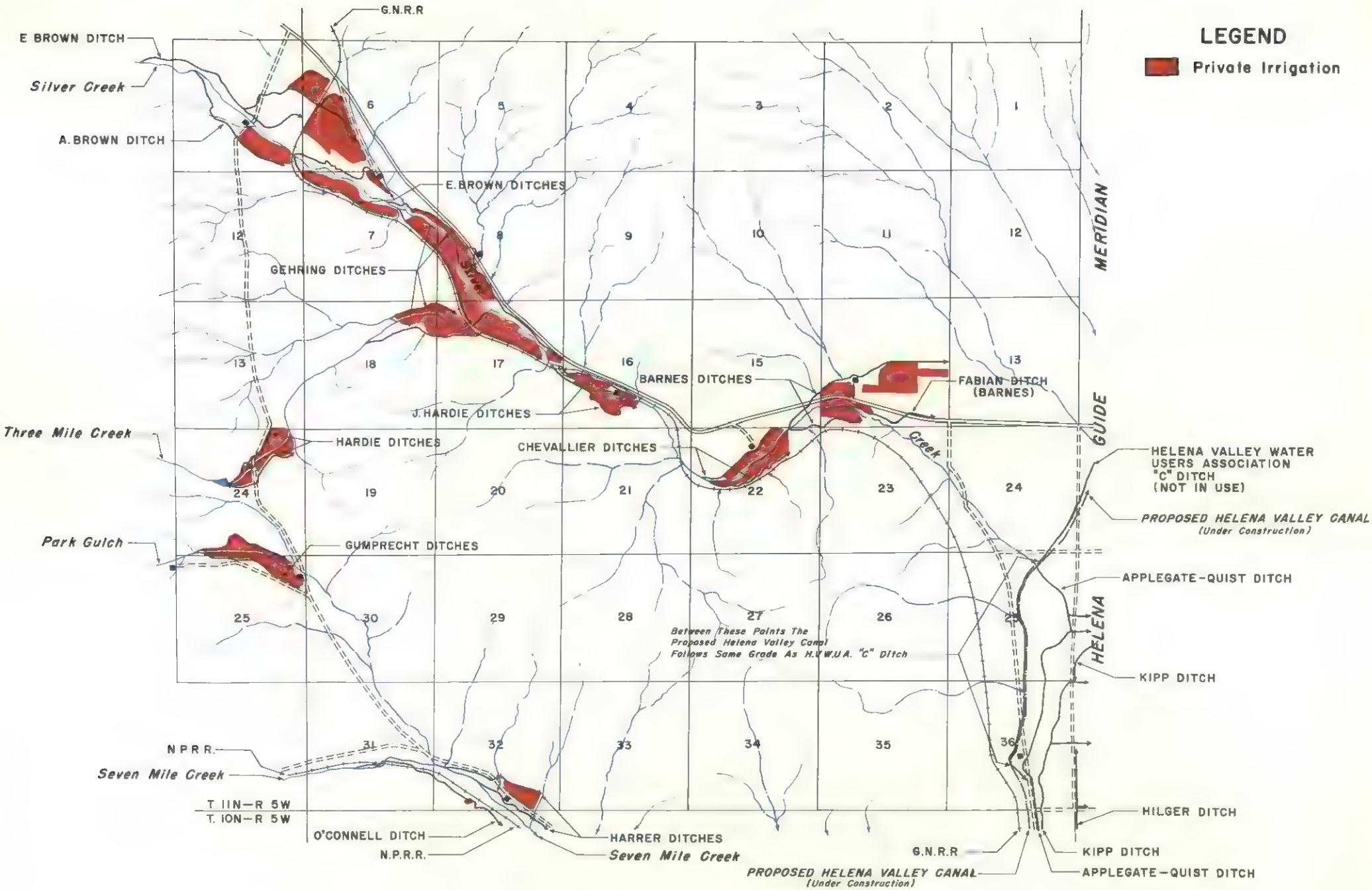
Rge. 4 WEST



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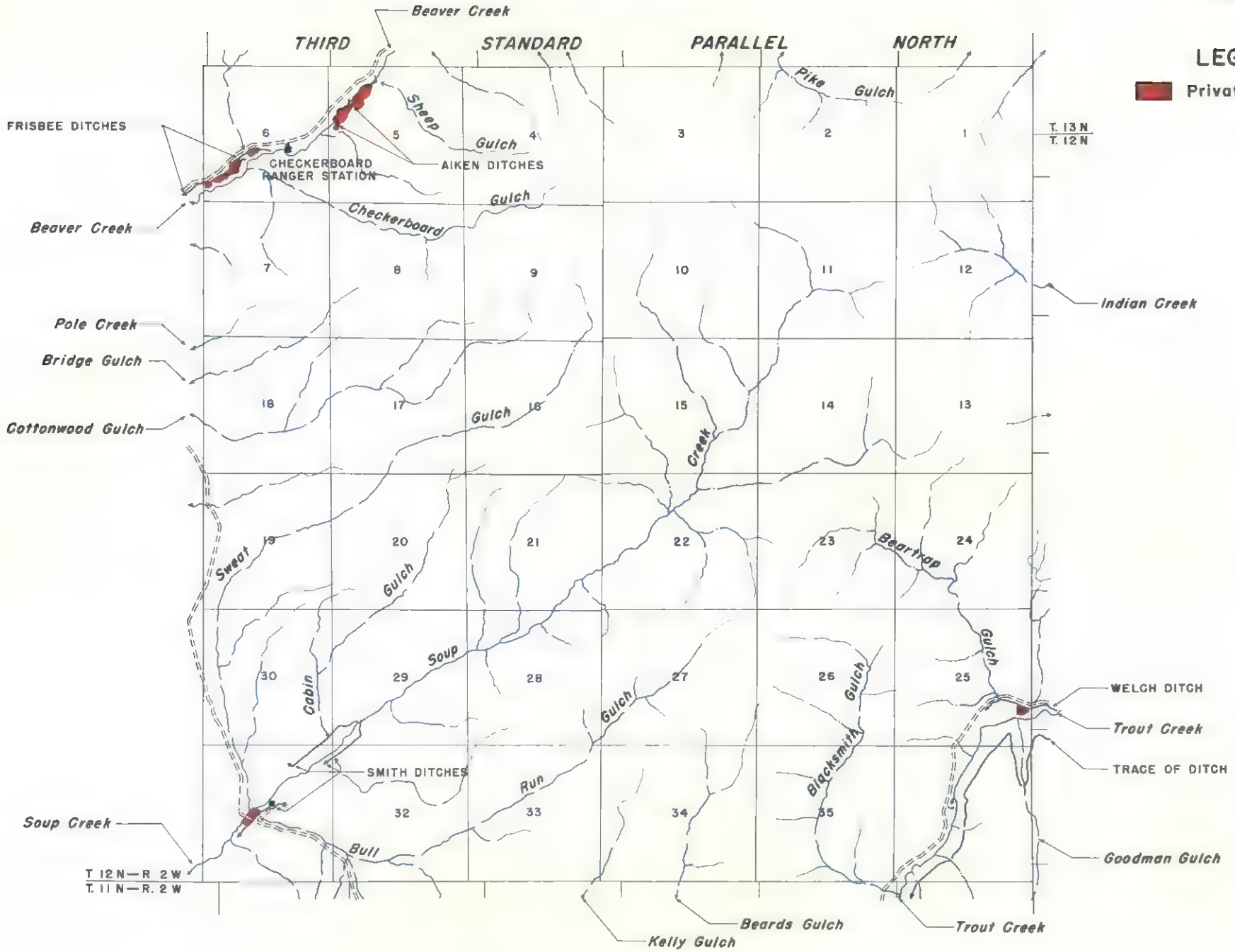

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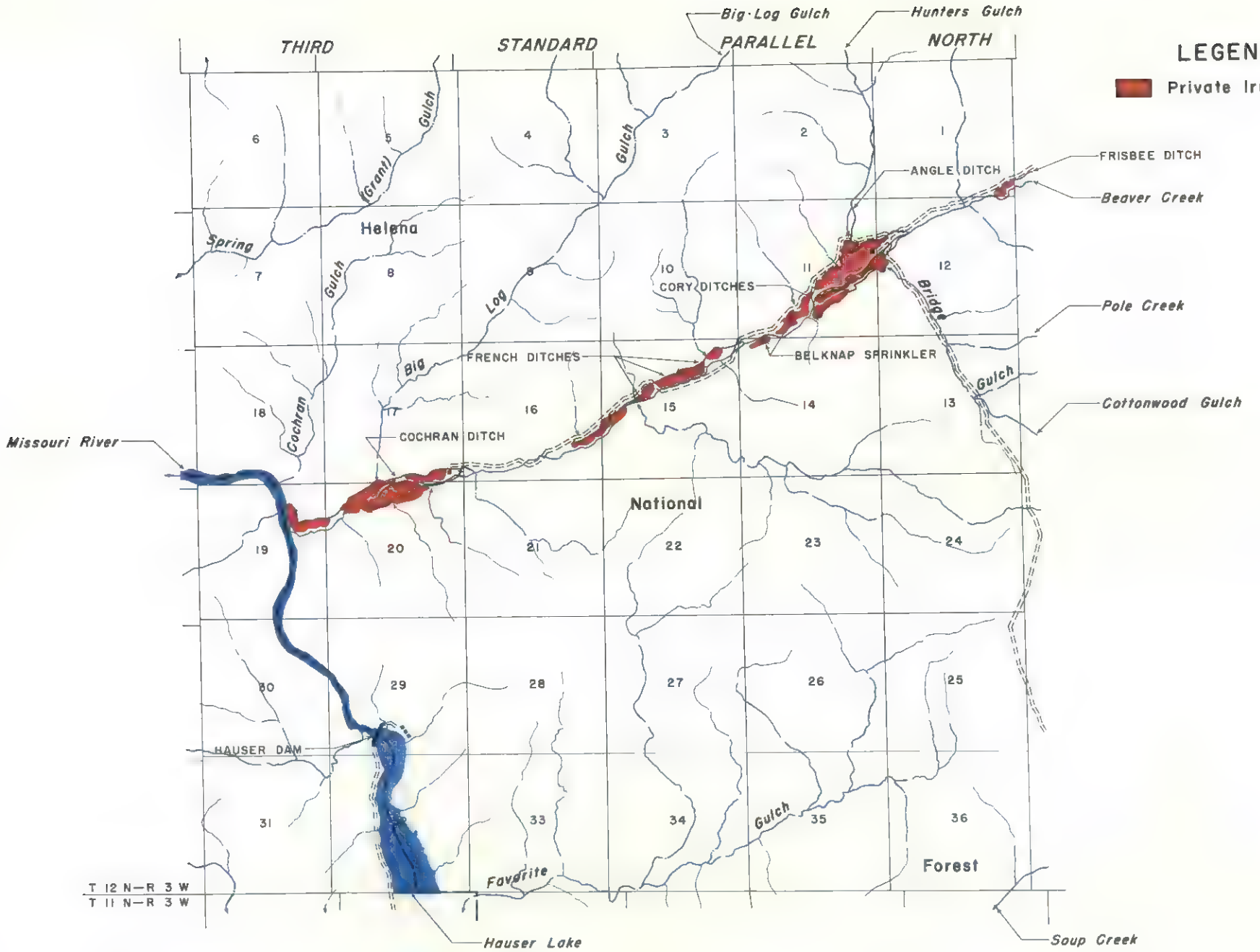
Rge. 2 WEST



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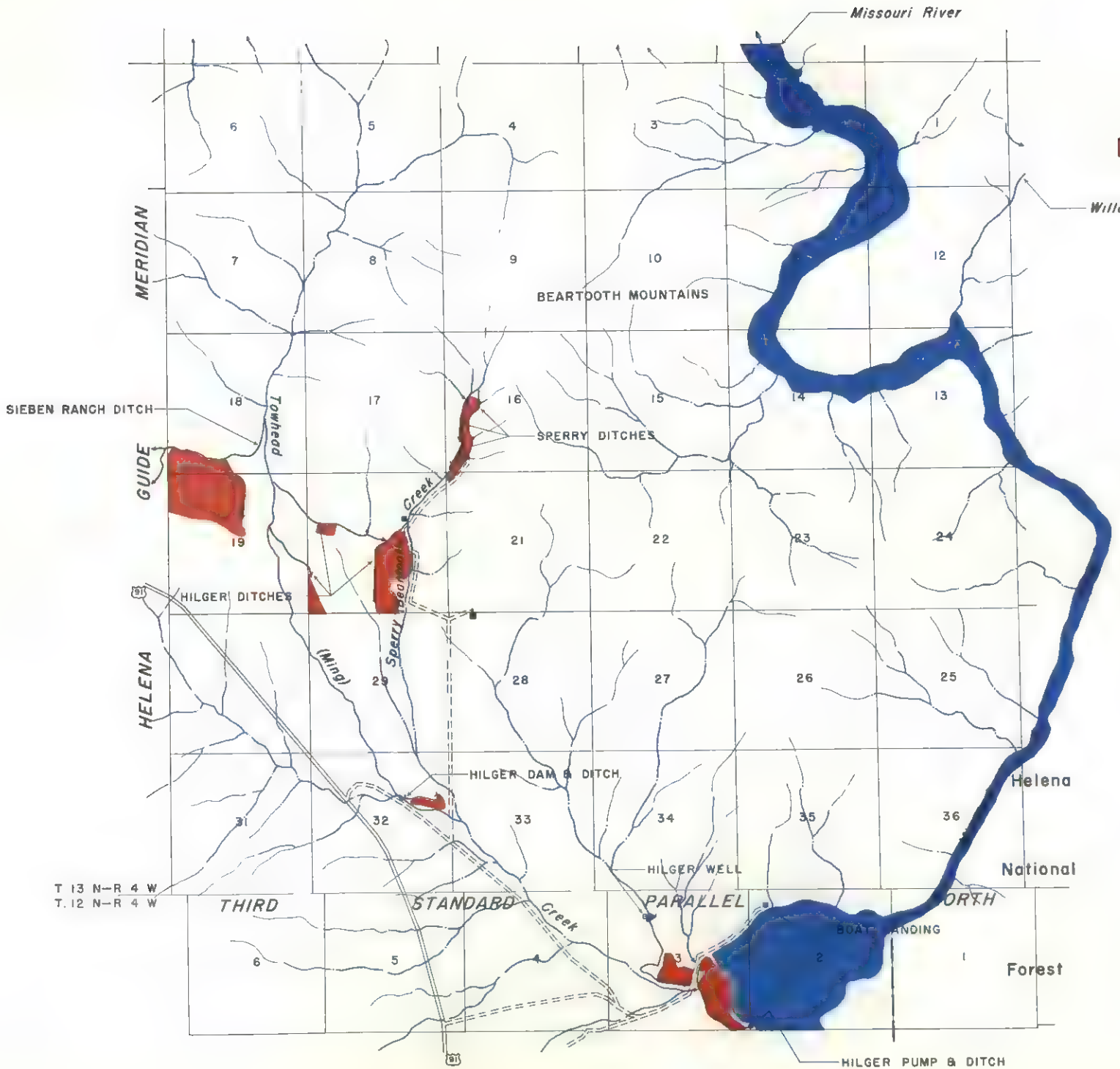
Rge. 3 WEST



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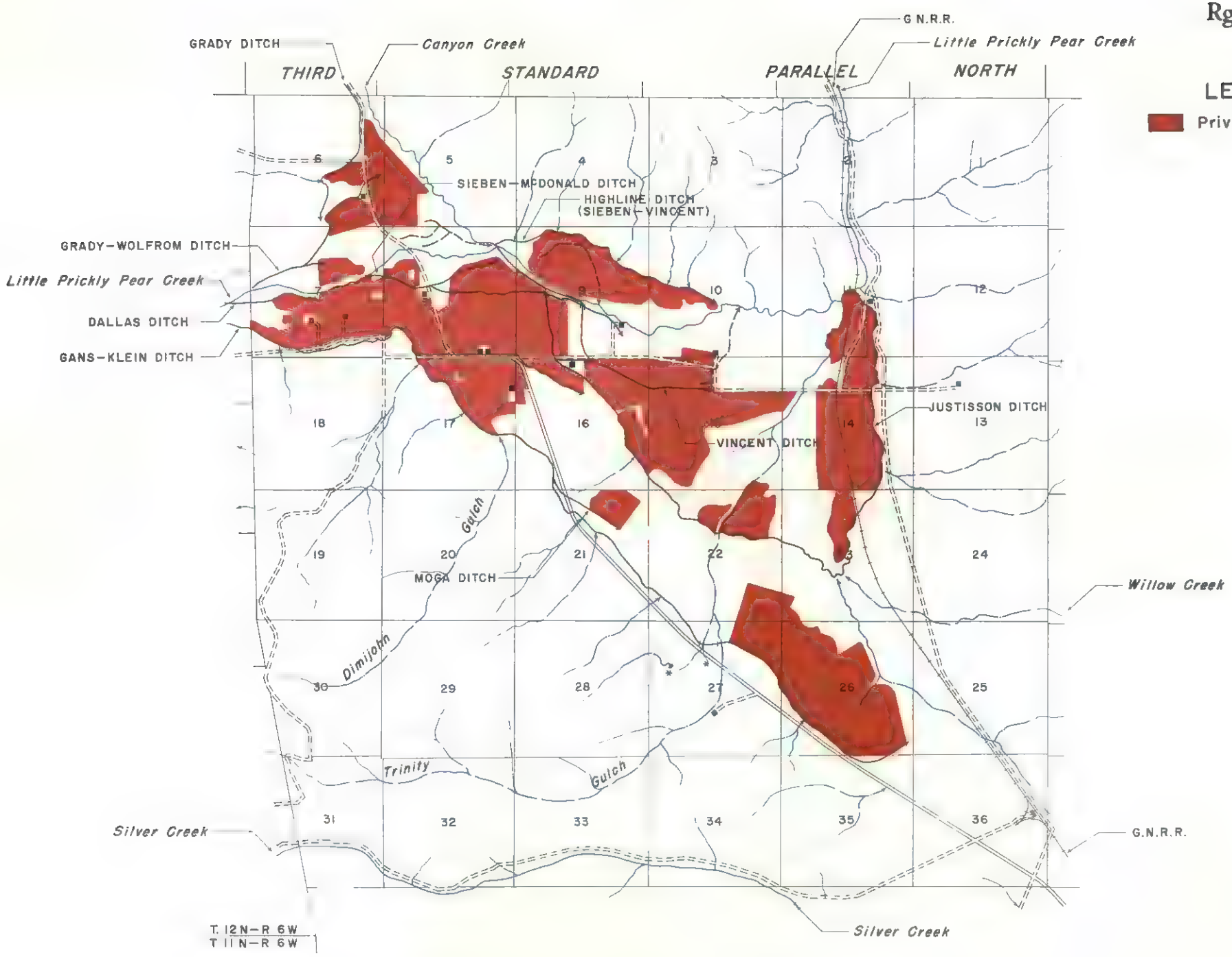
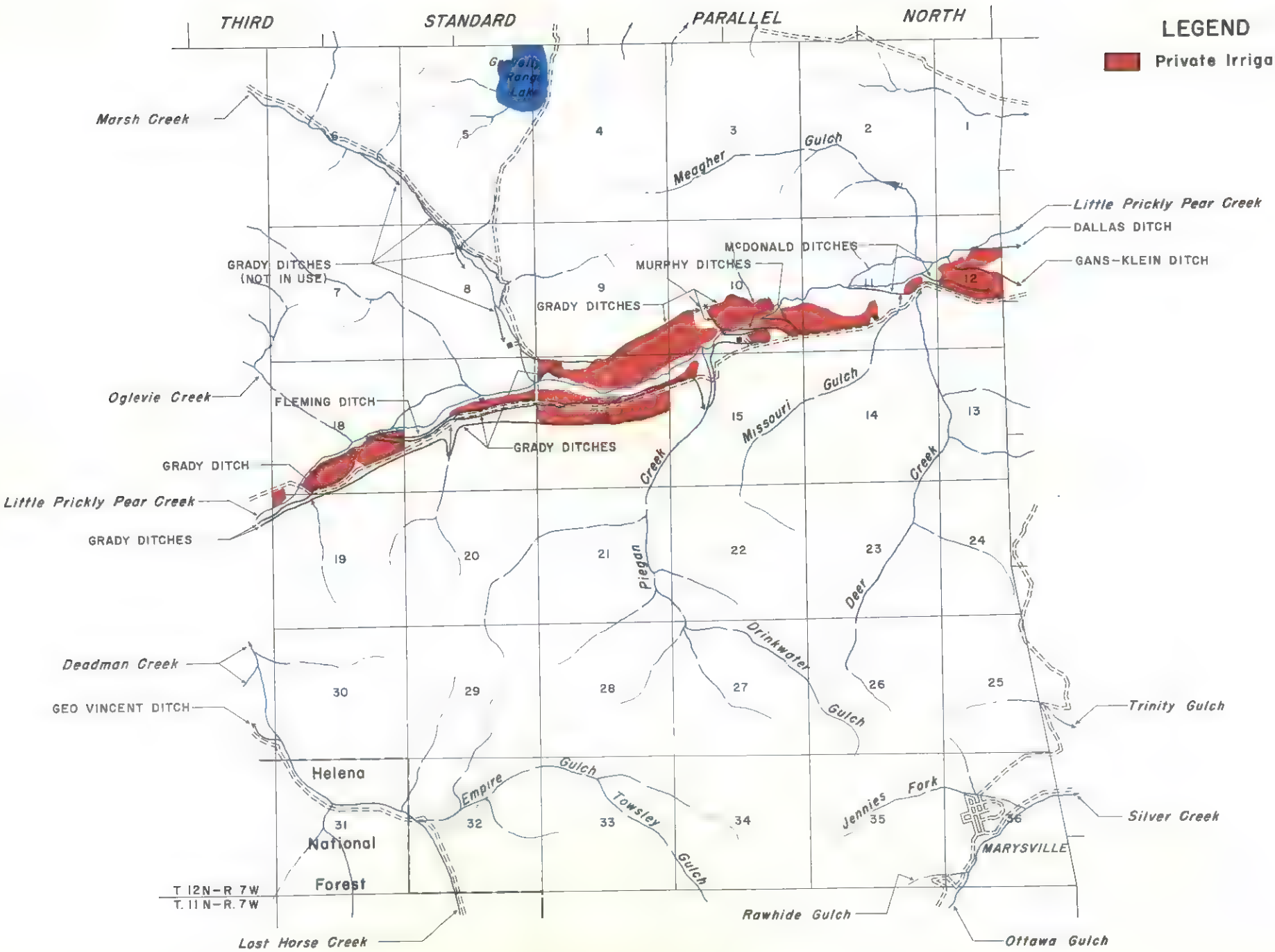
Rge. 5 WEST



LEGEND

Private Irrigation

Twp. 12 NORTH
Rge. 6 WEST



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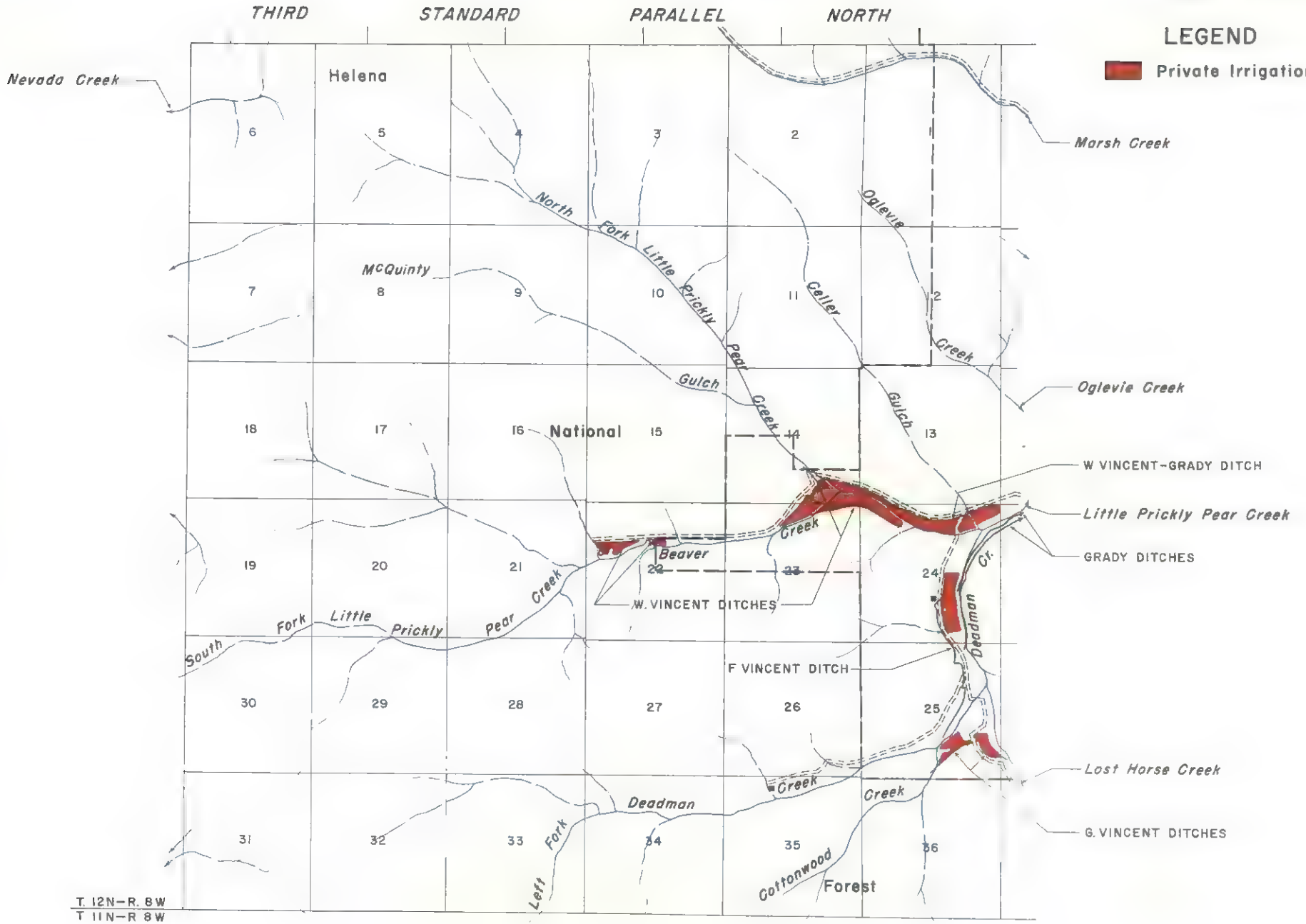
Rge. 7 WEST



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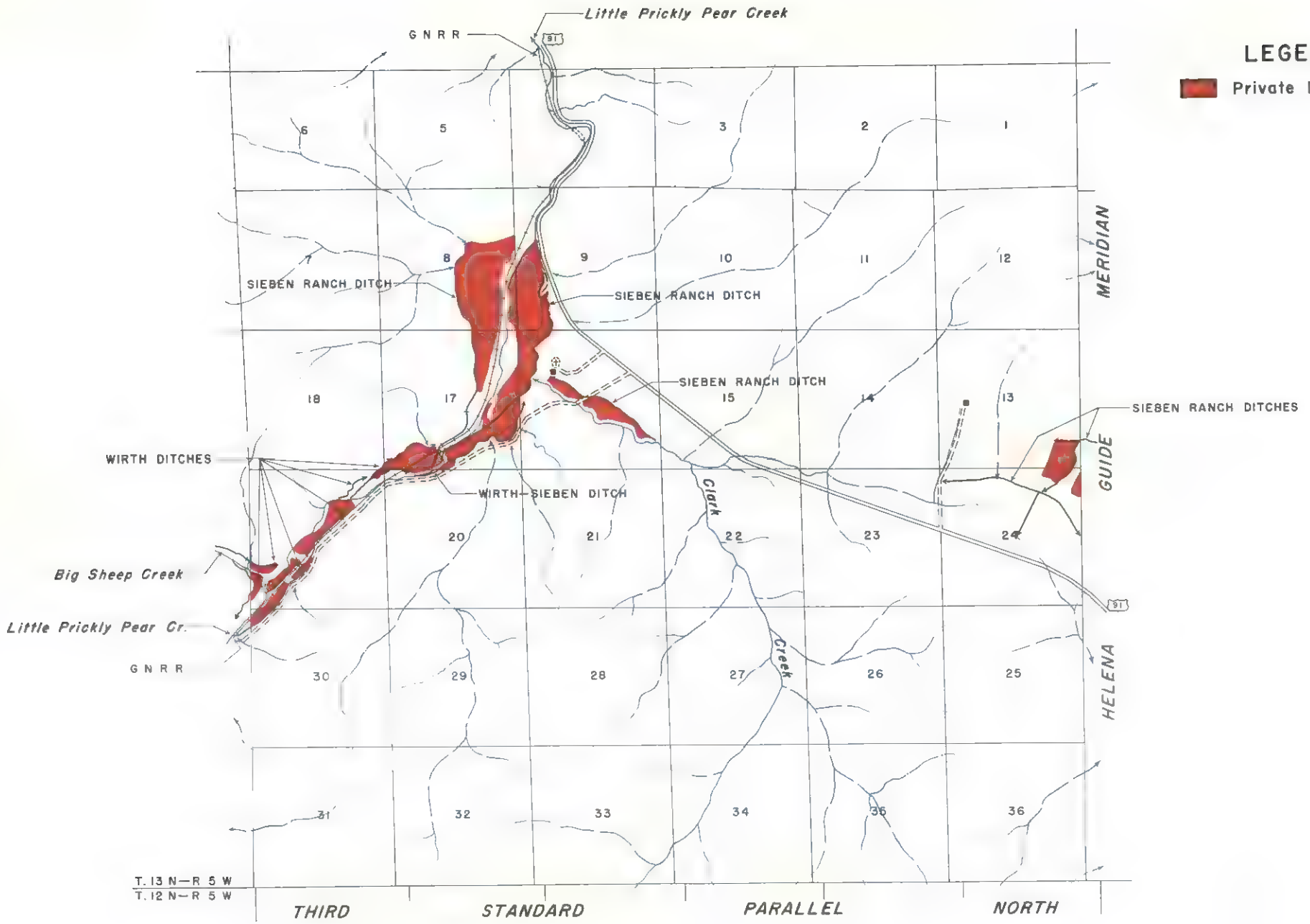
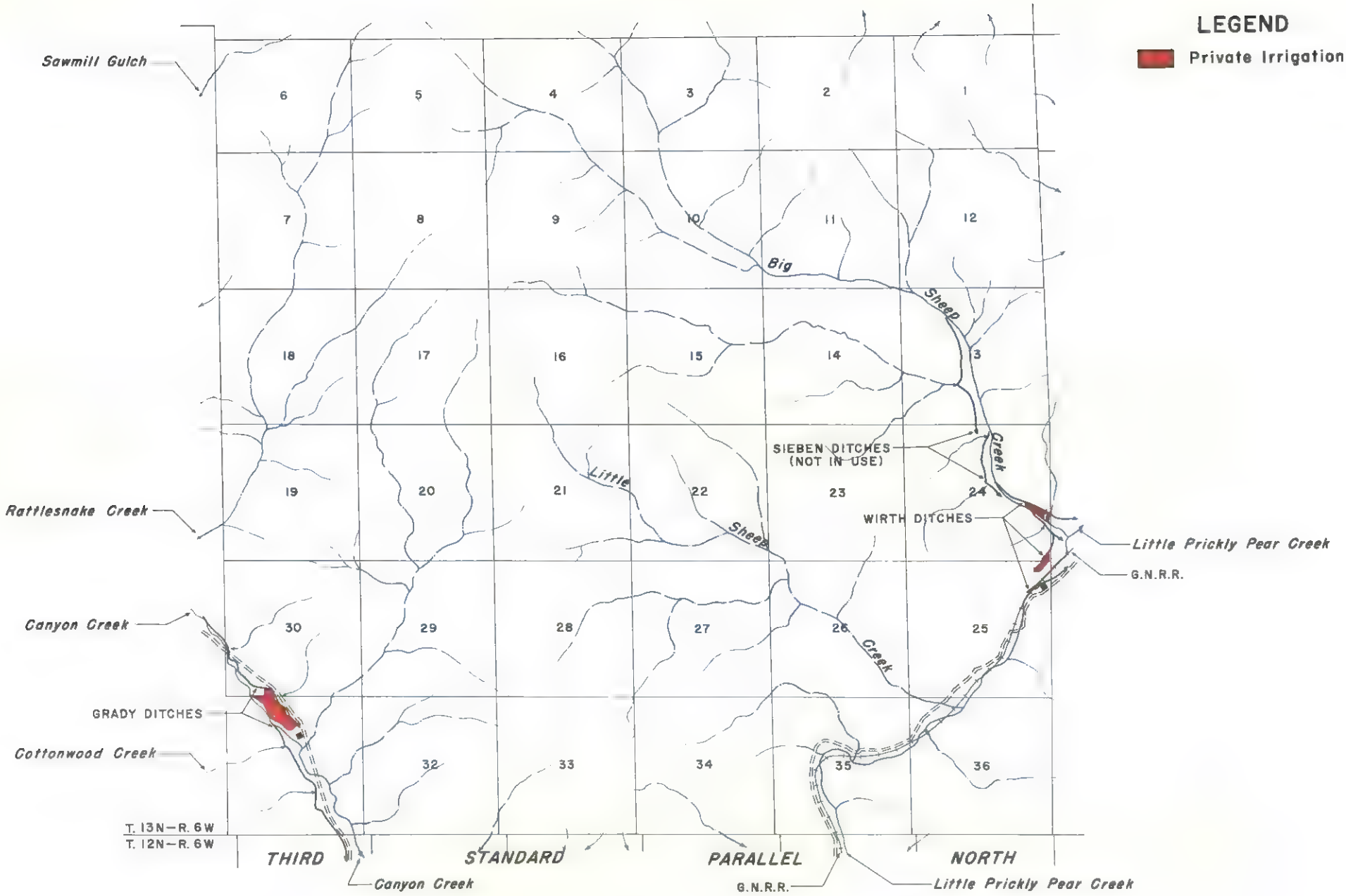
Rge. 4 WEST



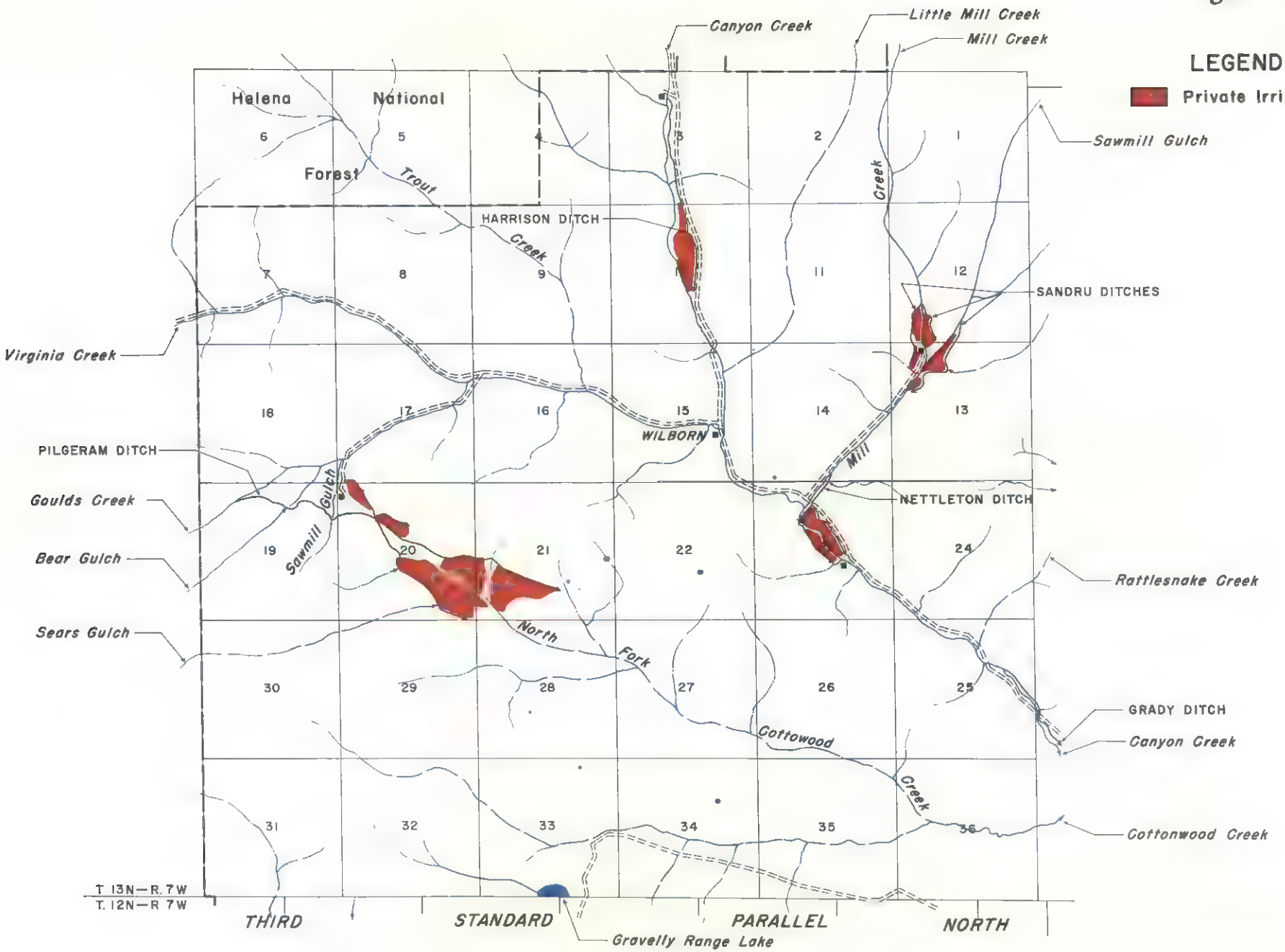
LEGEND

Private Irrigation

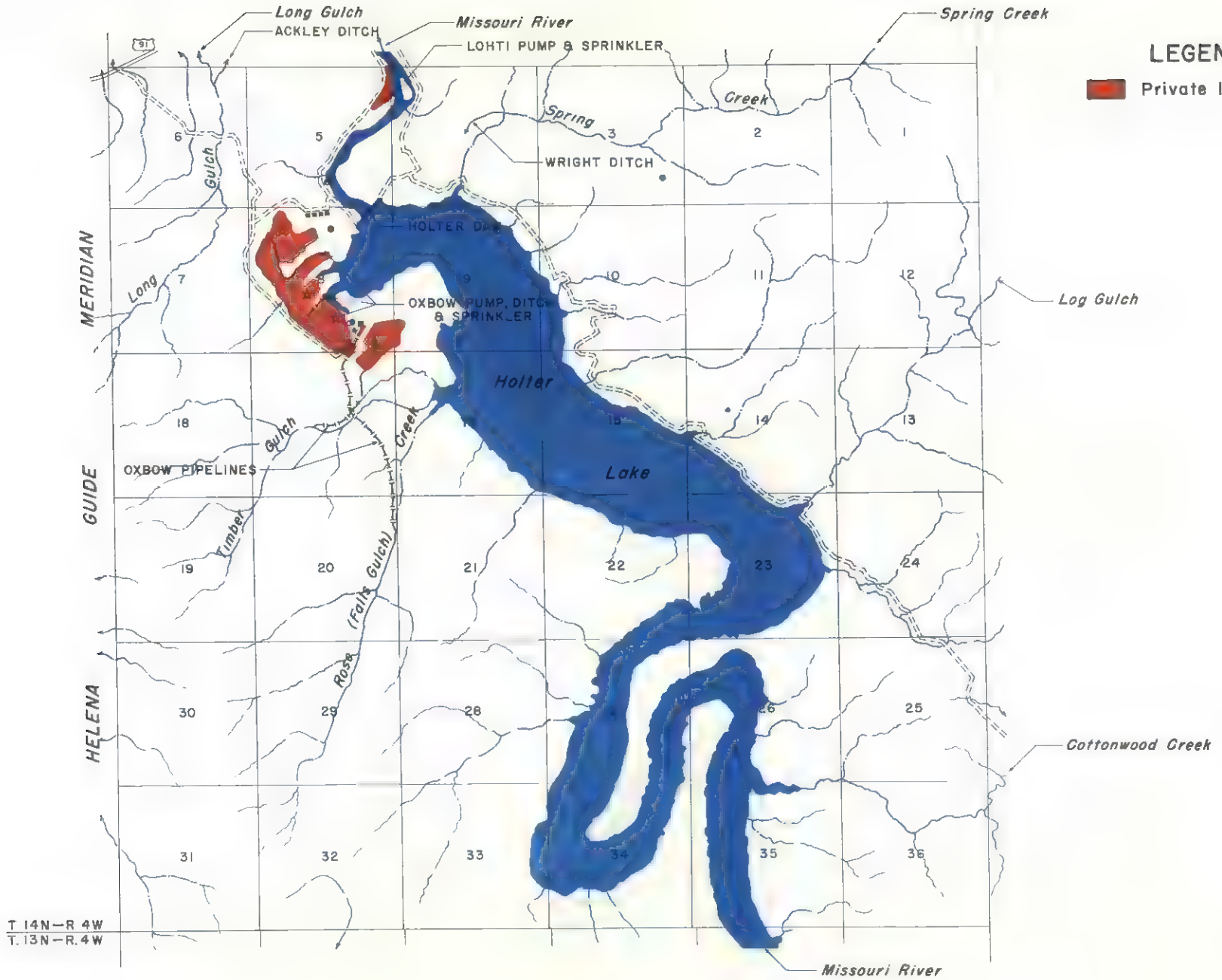
Twp. 13 NORTH
Rge. 5 WEST

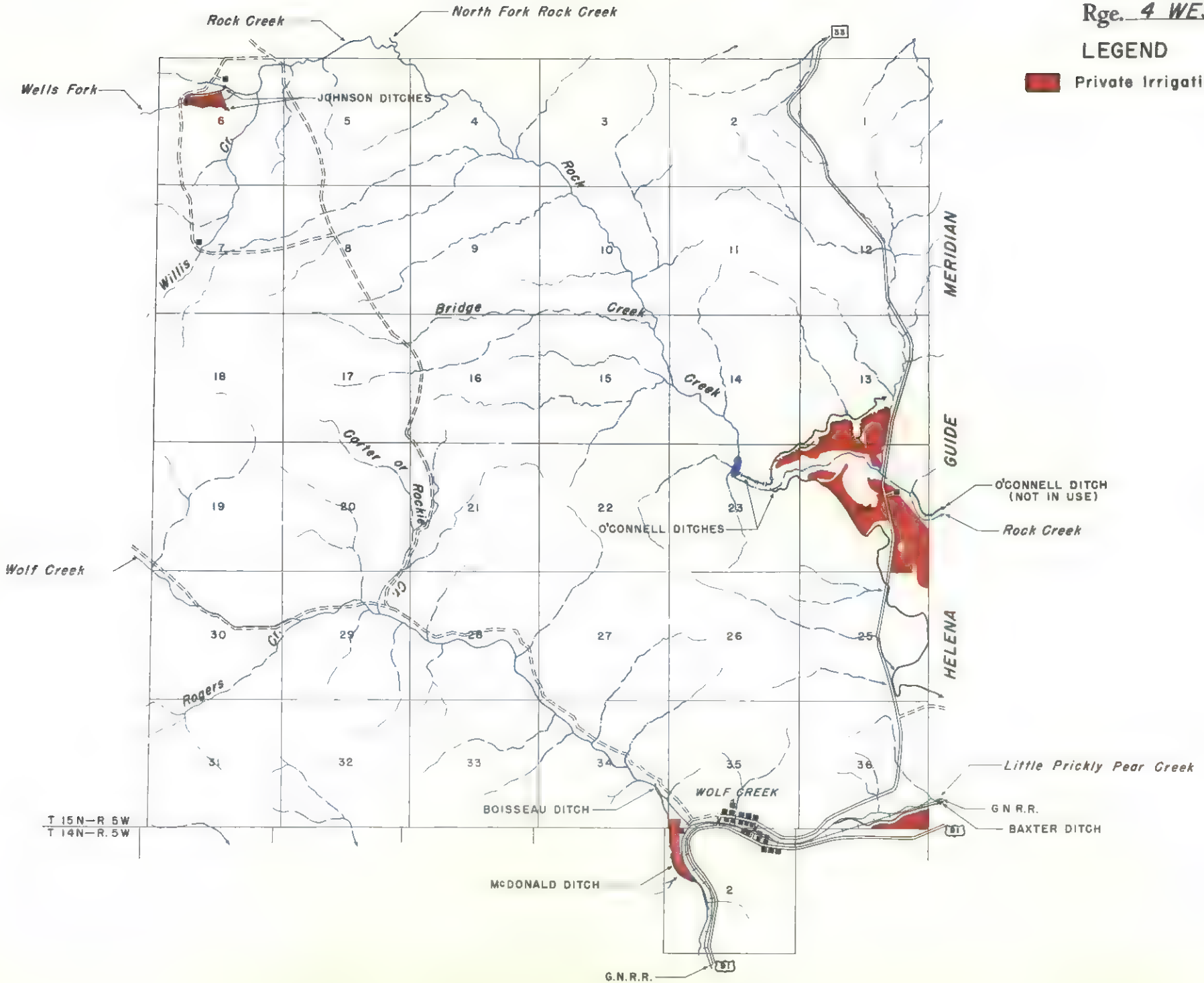


Twp. 13 NORTH
Rge. 6 WEST



Twp. 14 NORTH
Rge. 3 WEST




Twp. 15 NORTH
Rge. 4 WEST
LEGEND
Private Irrigation
Rock Creek
North Fork Rock Creek
Wells Fork
JOHNSON DITCHES
Willis Gr.
Rock Creek
Bridge Creek
Carter or Rocky Cr.
Wolf Creek
Rogers Gr.
O'CONNELL DITCHES
O'CONNELL DITCH (NOT IN USE)
Rock Creek
GUIDE MERIDIAN
HELENA
Little Prickly Pear Creek
WOLF CREEK
BOISSEAU DITCH
G N R.R.
BAXTER DITCH
McDONALD DITCH
G.N.R.R.
T 15N—R 5W
T 14N—R. 5W
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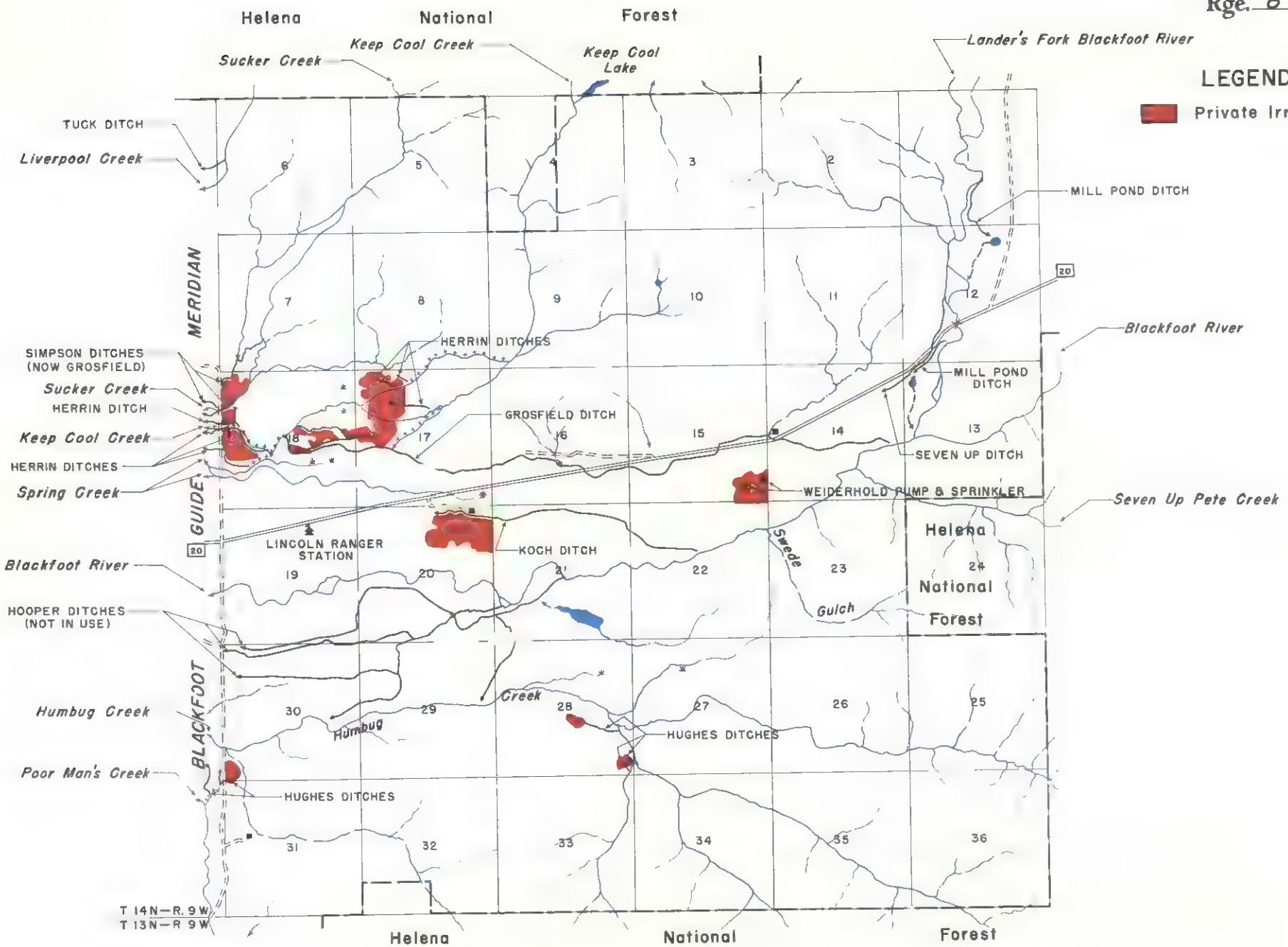
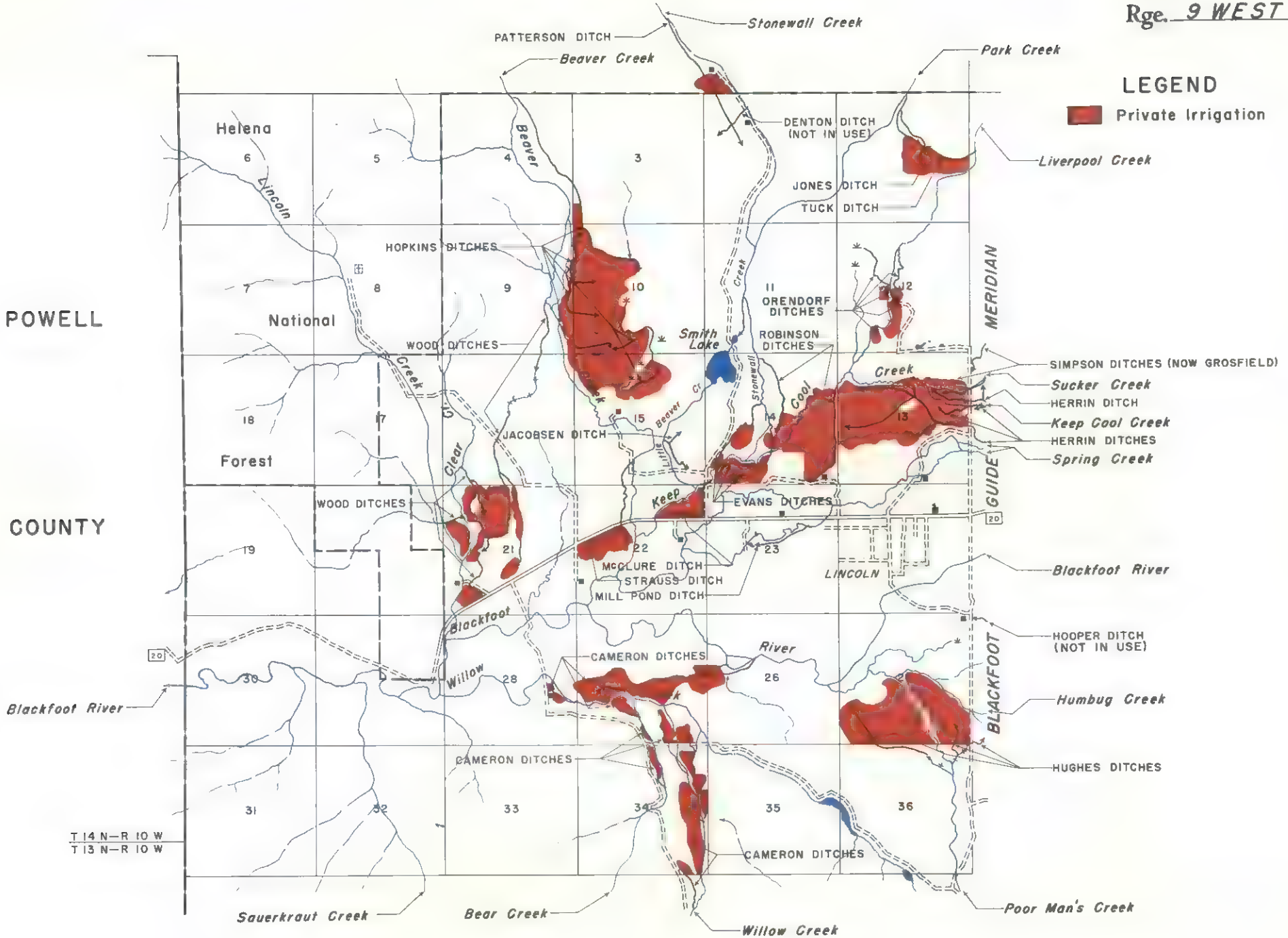
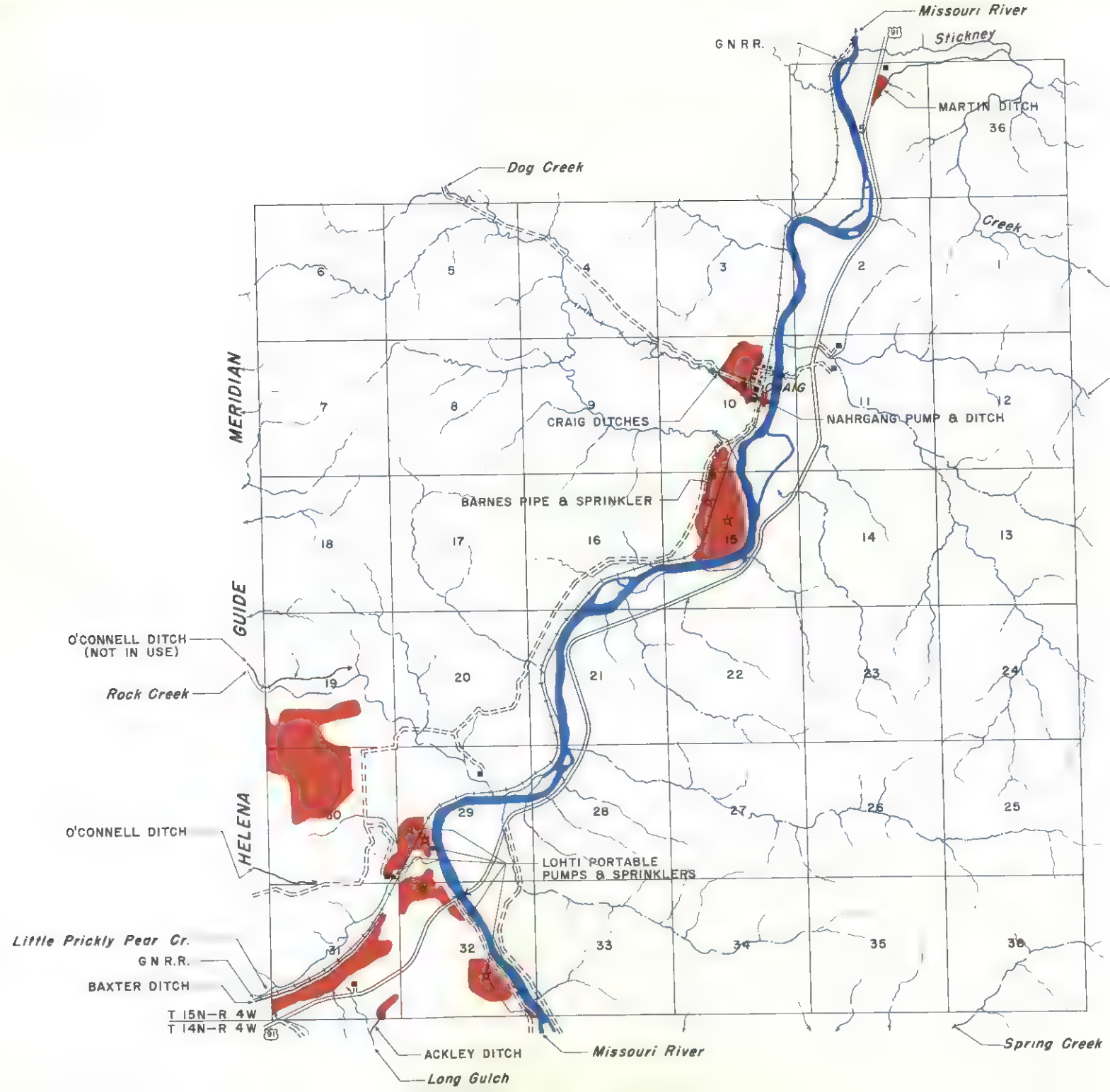
Twp. 14 NORTH
Rge. 8 WEST



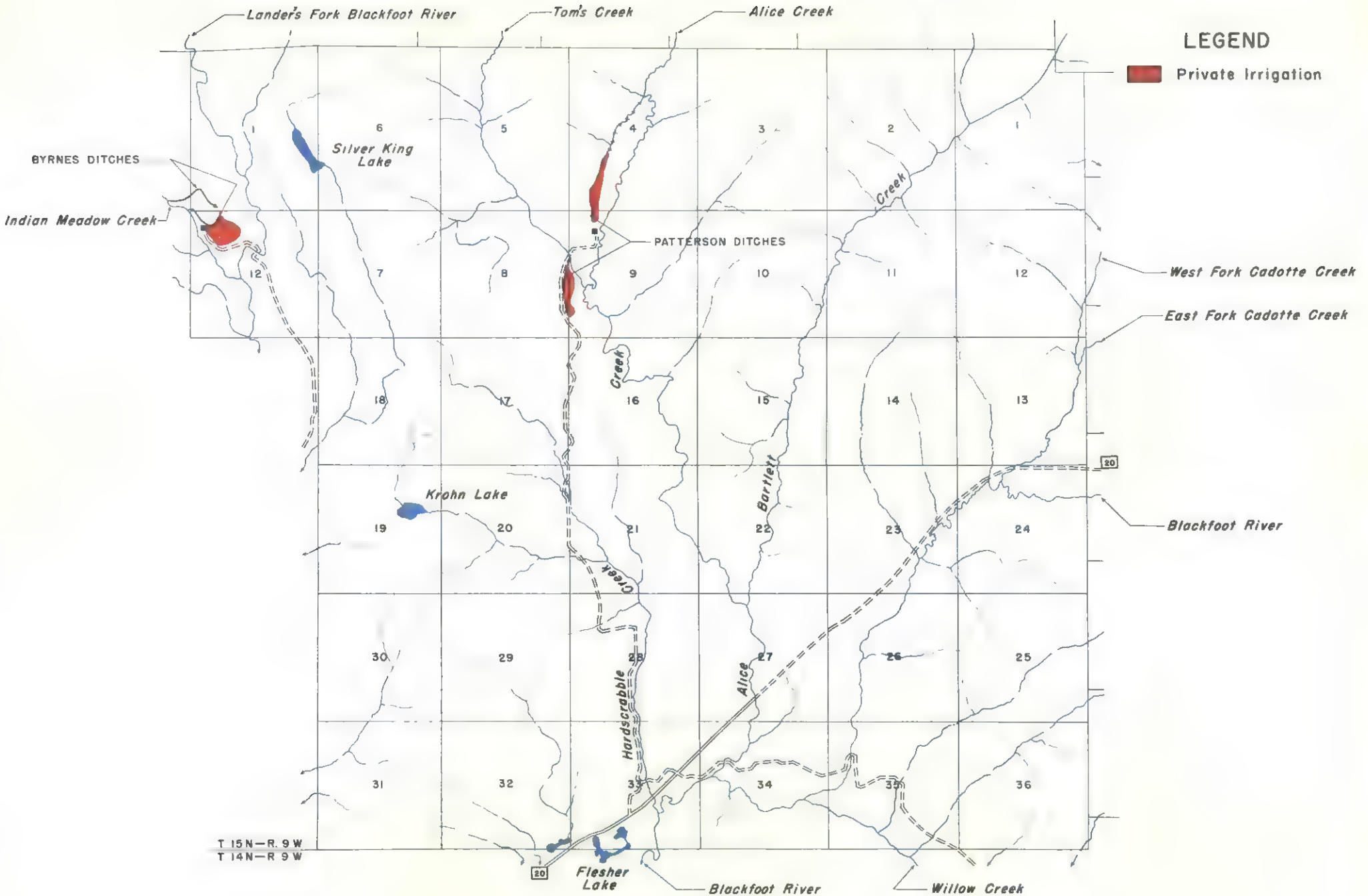
Twp. 14 NORTH
Rge. 9 WEST



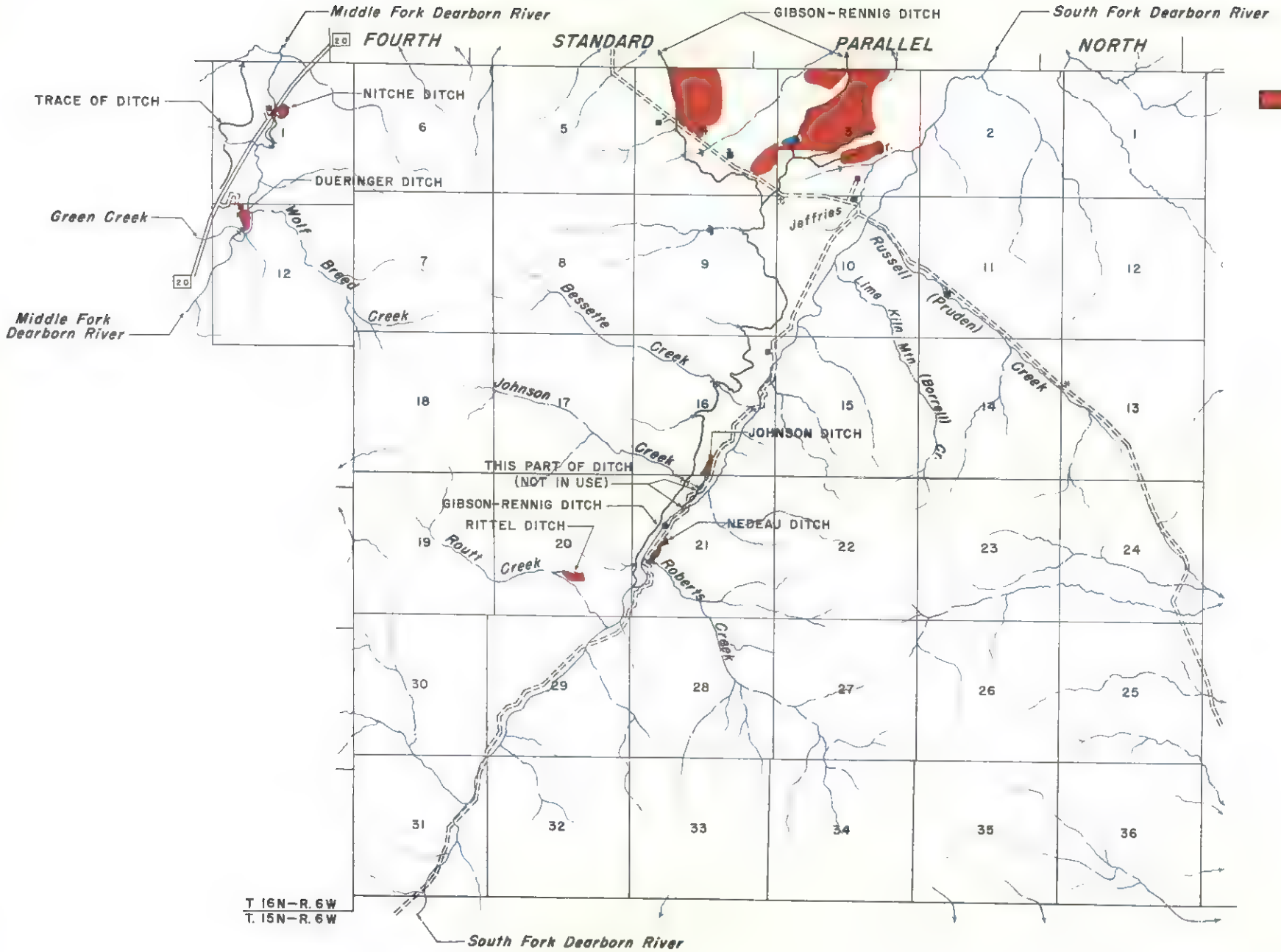
Twp. 15 NORTH
Rge. 3 WEST



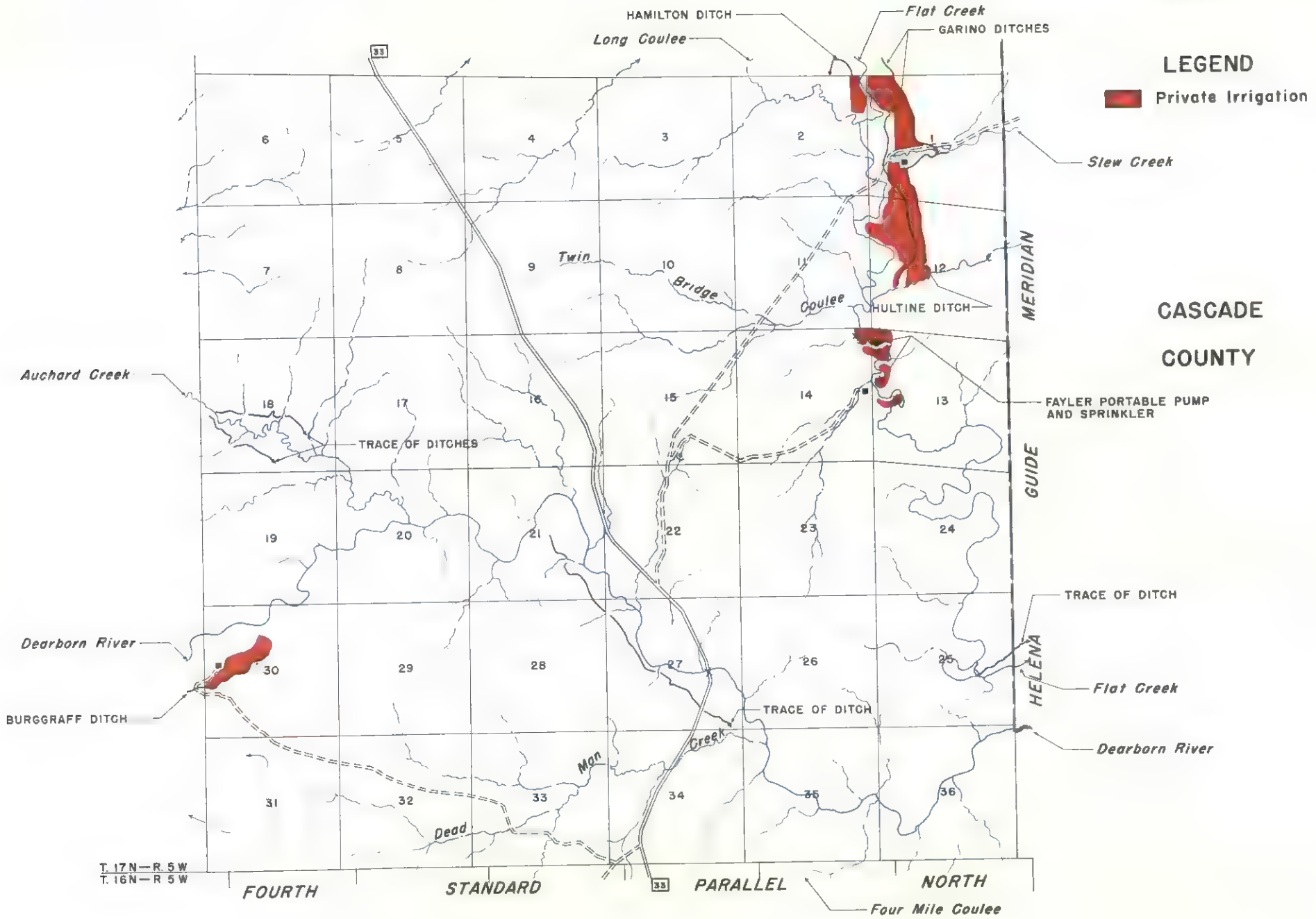
Twp. 15 NORTH
Rge. 7 & 8 WEST



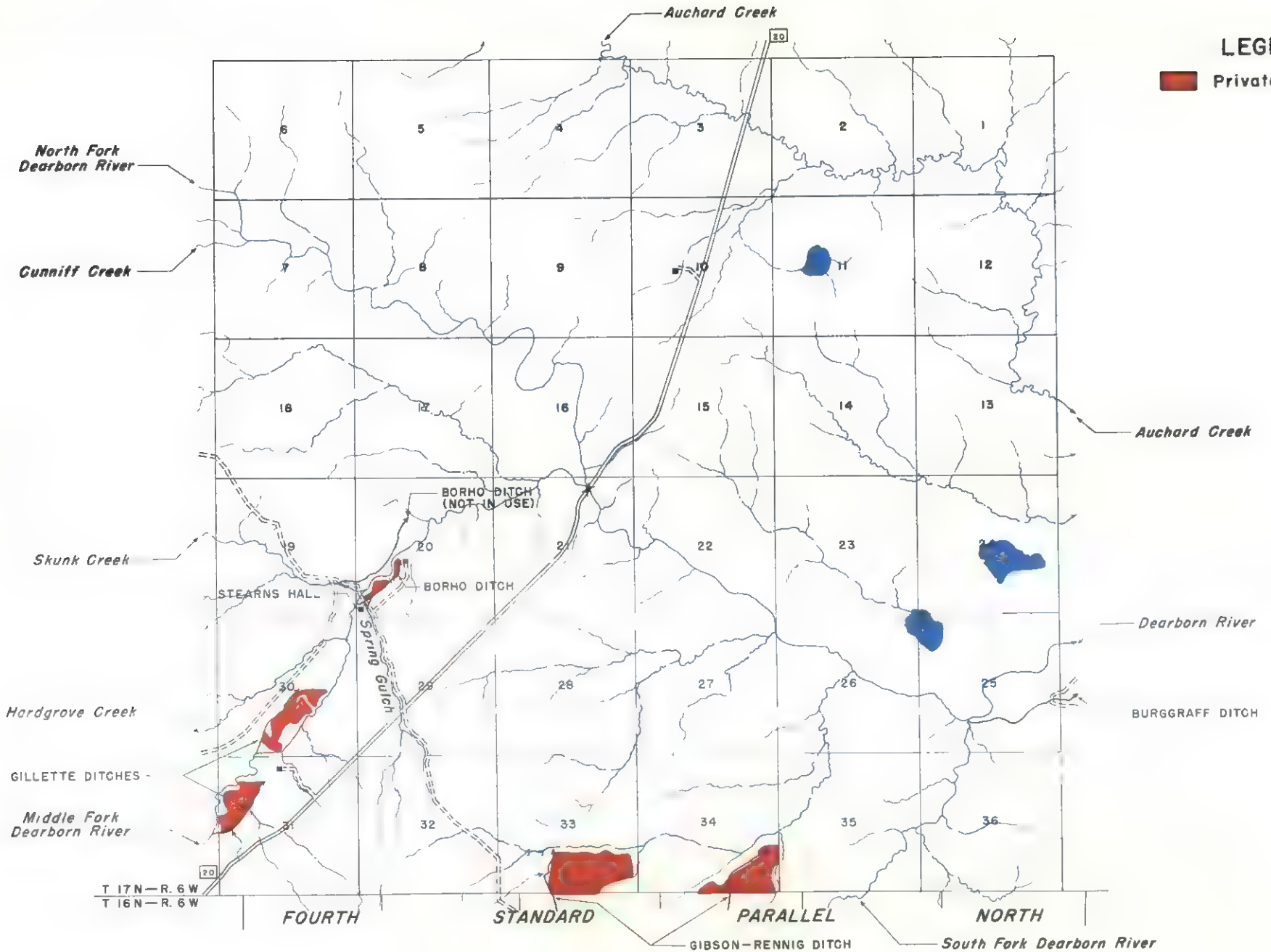
Twp. 16 NORTH
Rge. 5 & 6 WEST



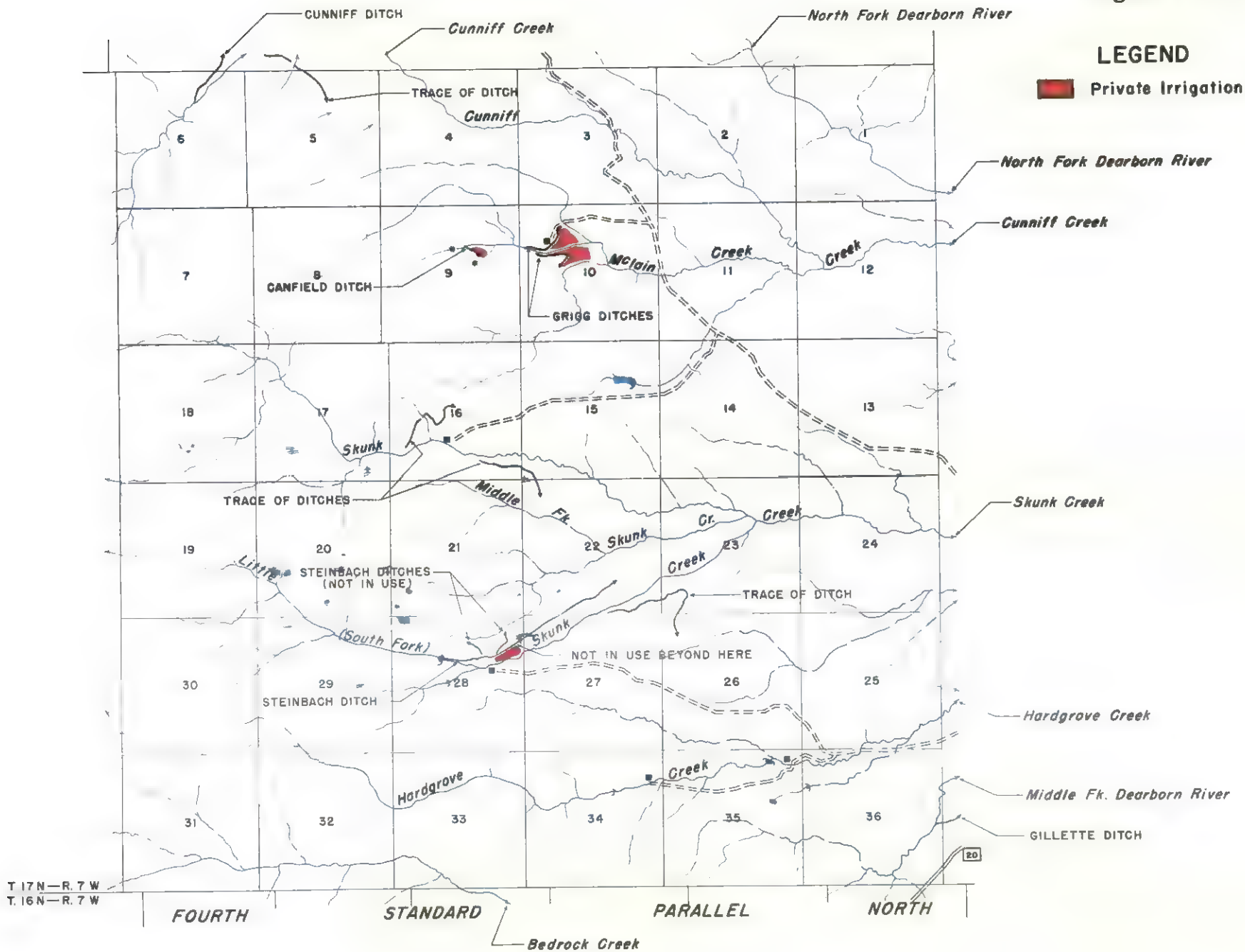
Twp. 17 NORTH
Rge. 4 WEST



Twp. 17 NORTH
Rge. 5 WEST



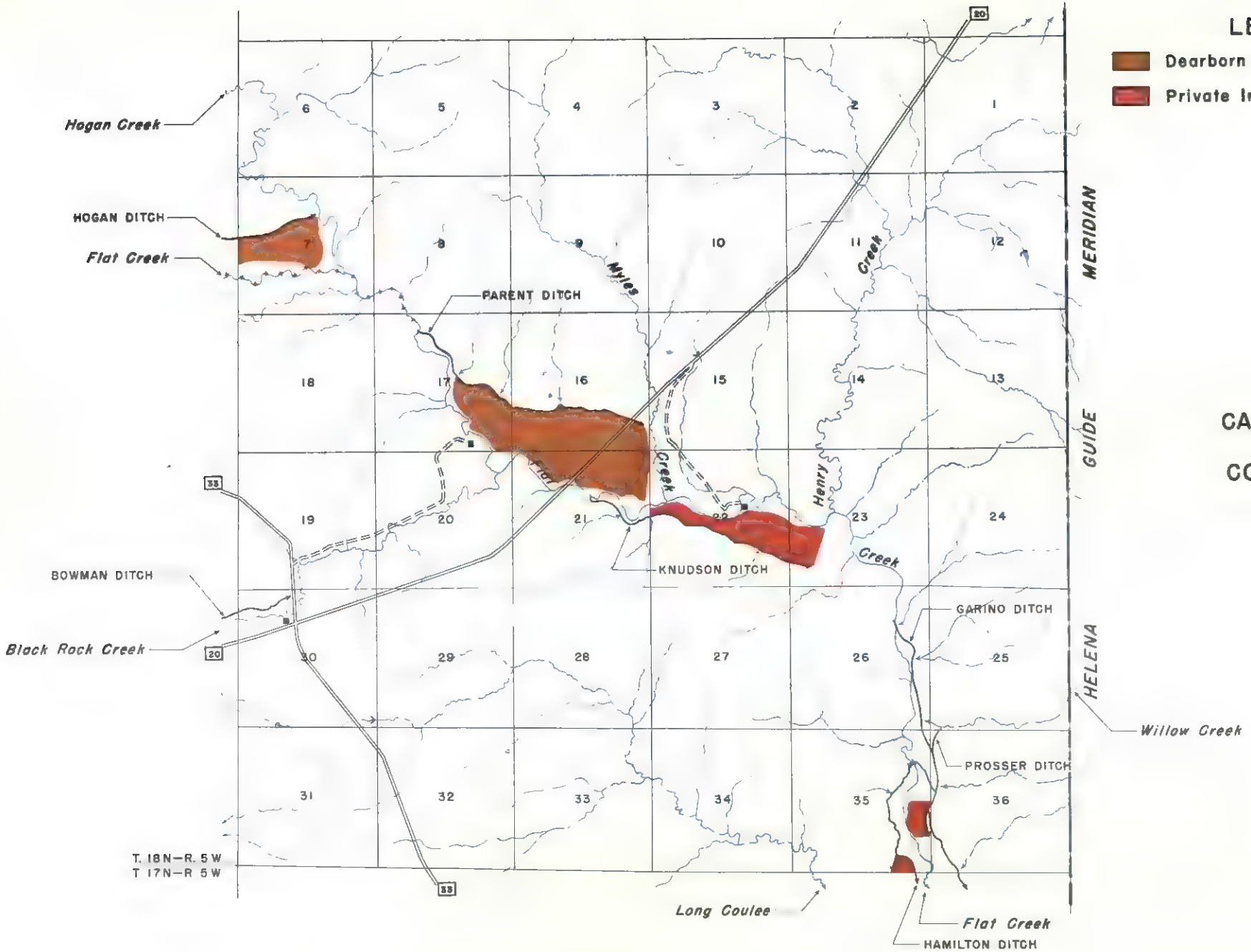
Twp. 17 NORTH
Rge. 6 WEST



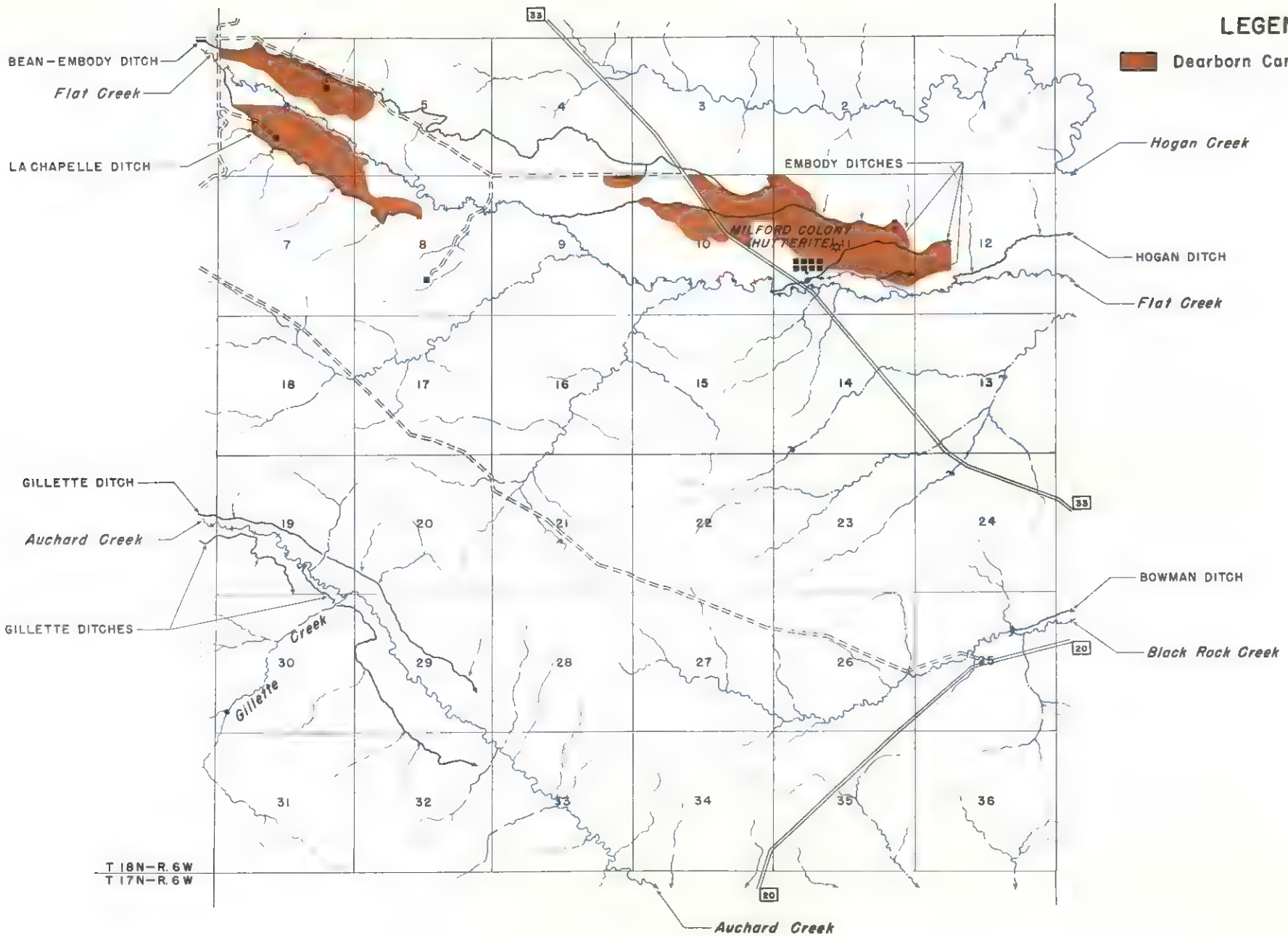
LEGEND

Private Irrigation

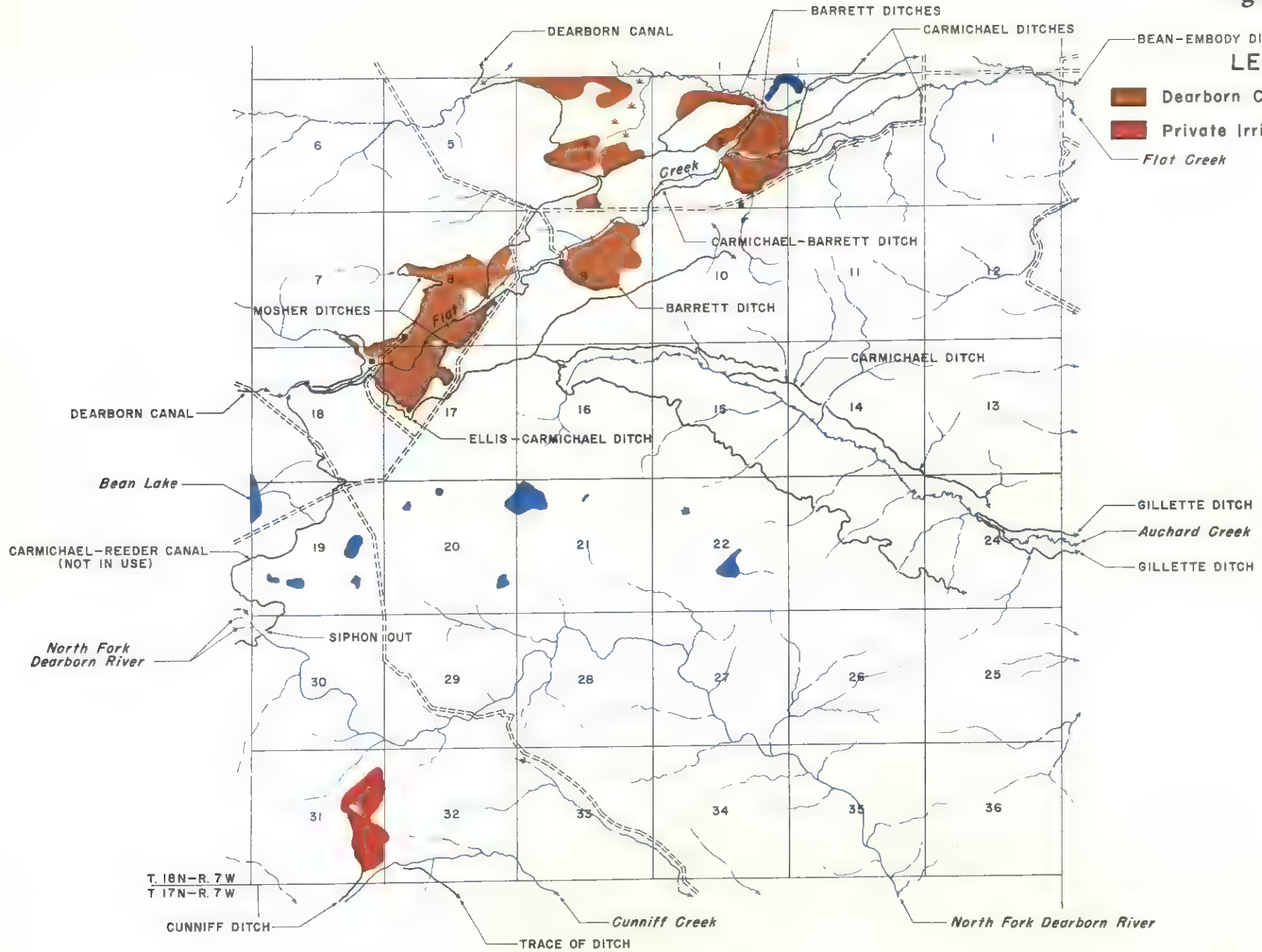
Twp. 18 NORTH
Rge. 4 WEST



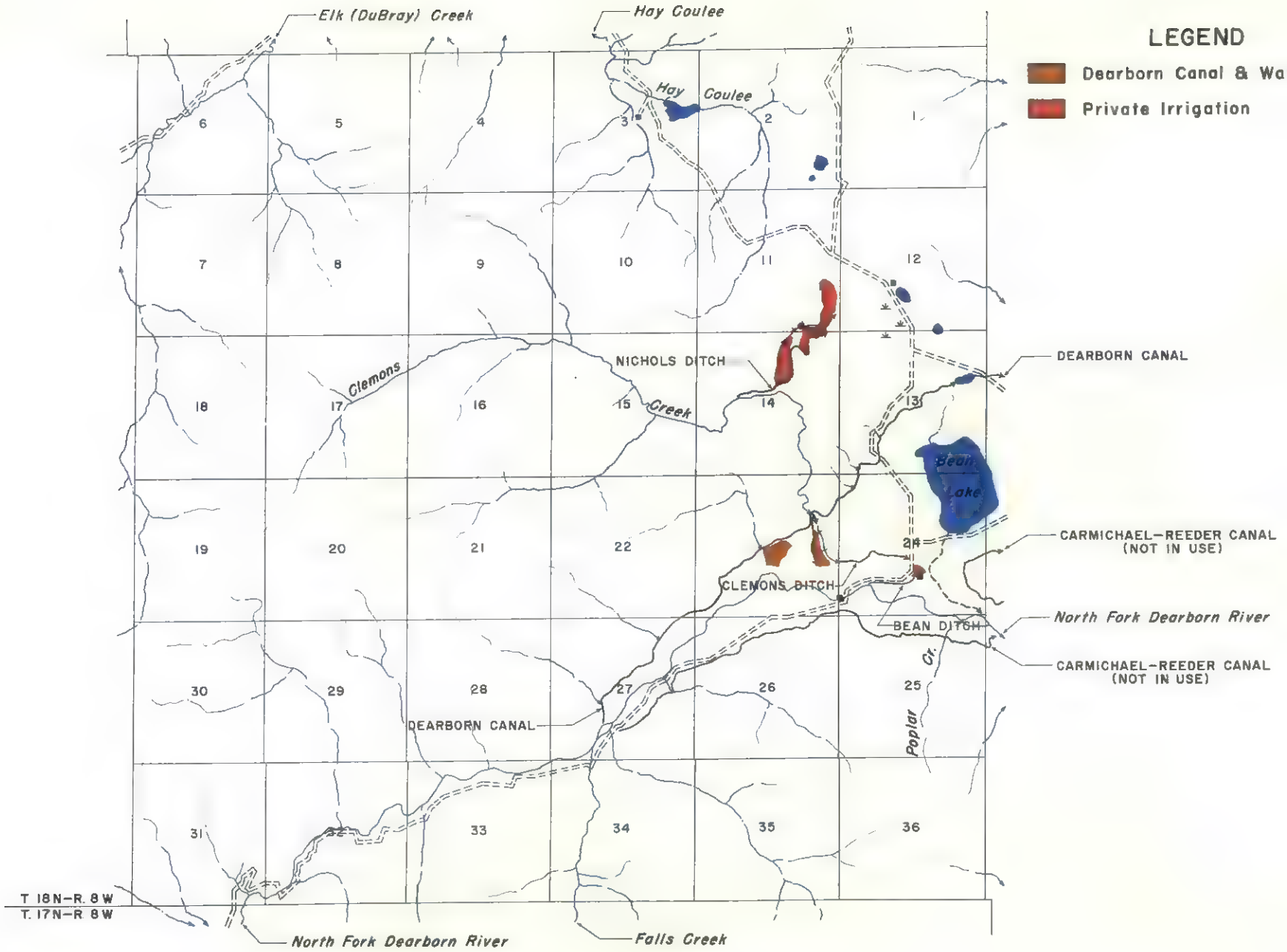
Twp. 18 NORTH
Rge. 5 WEST



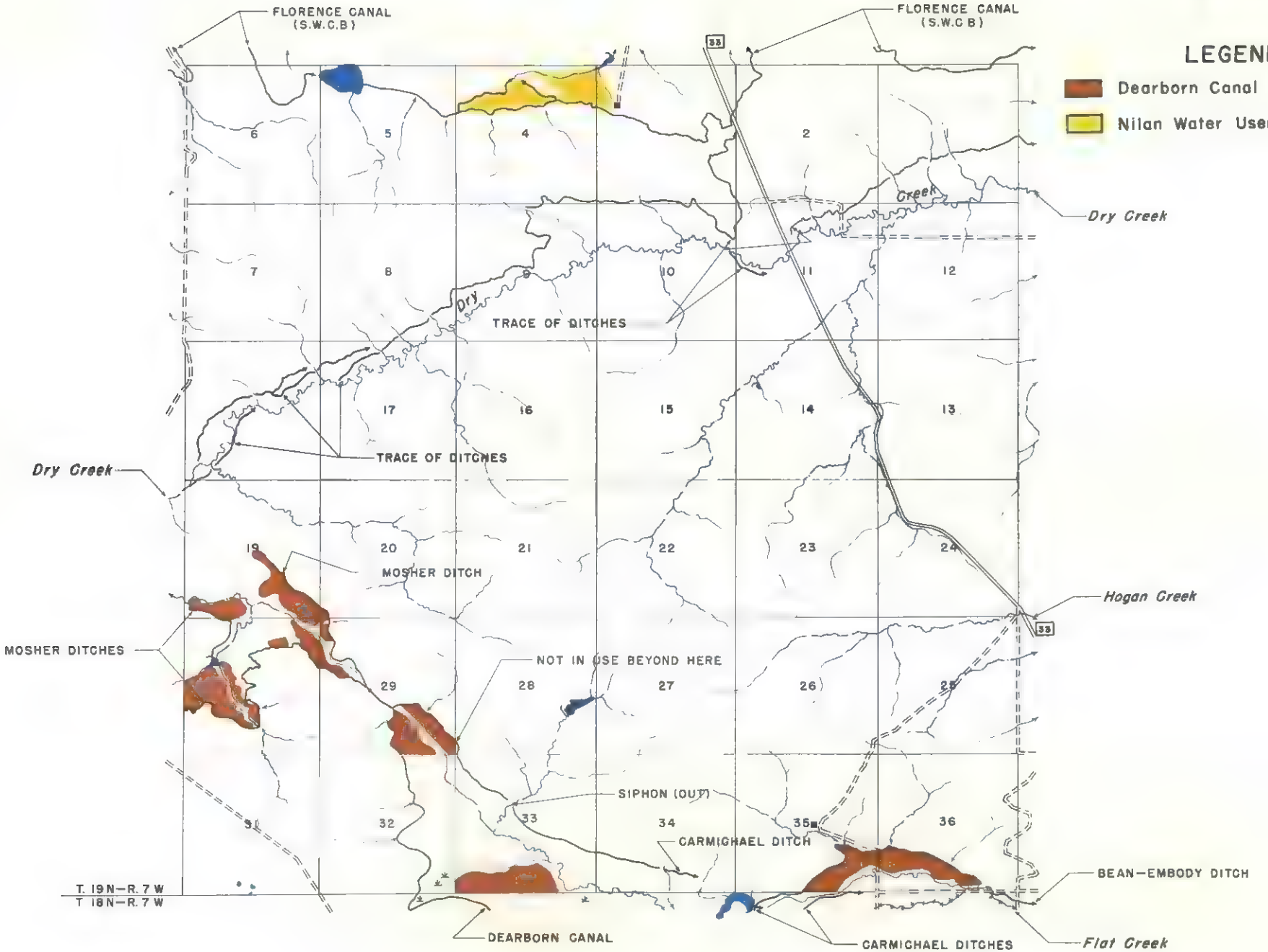
Twp. 18 NORTH
Rge. 6 WEST



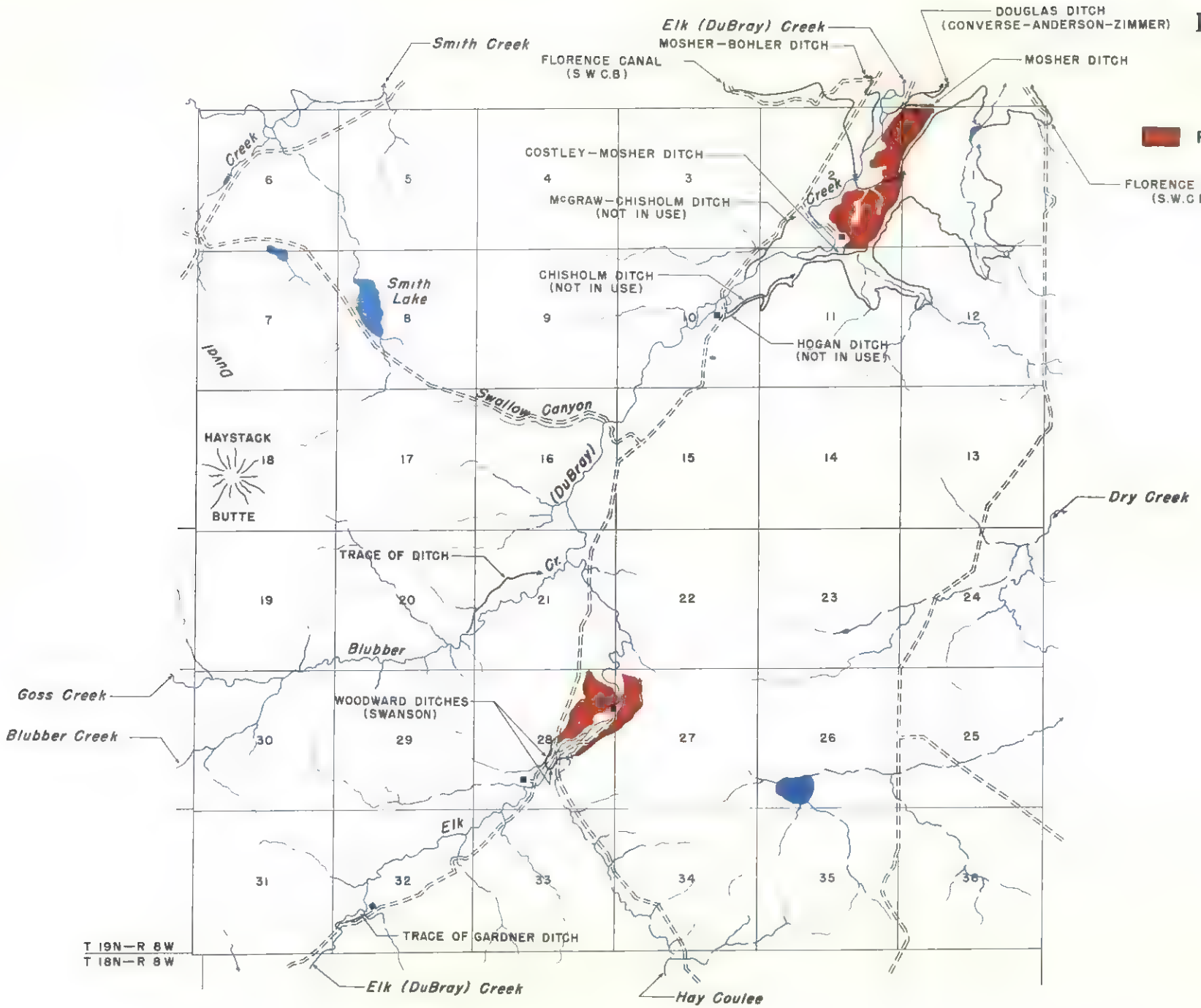
Twp. 18 NORTH
Rge. 7 WEST



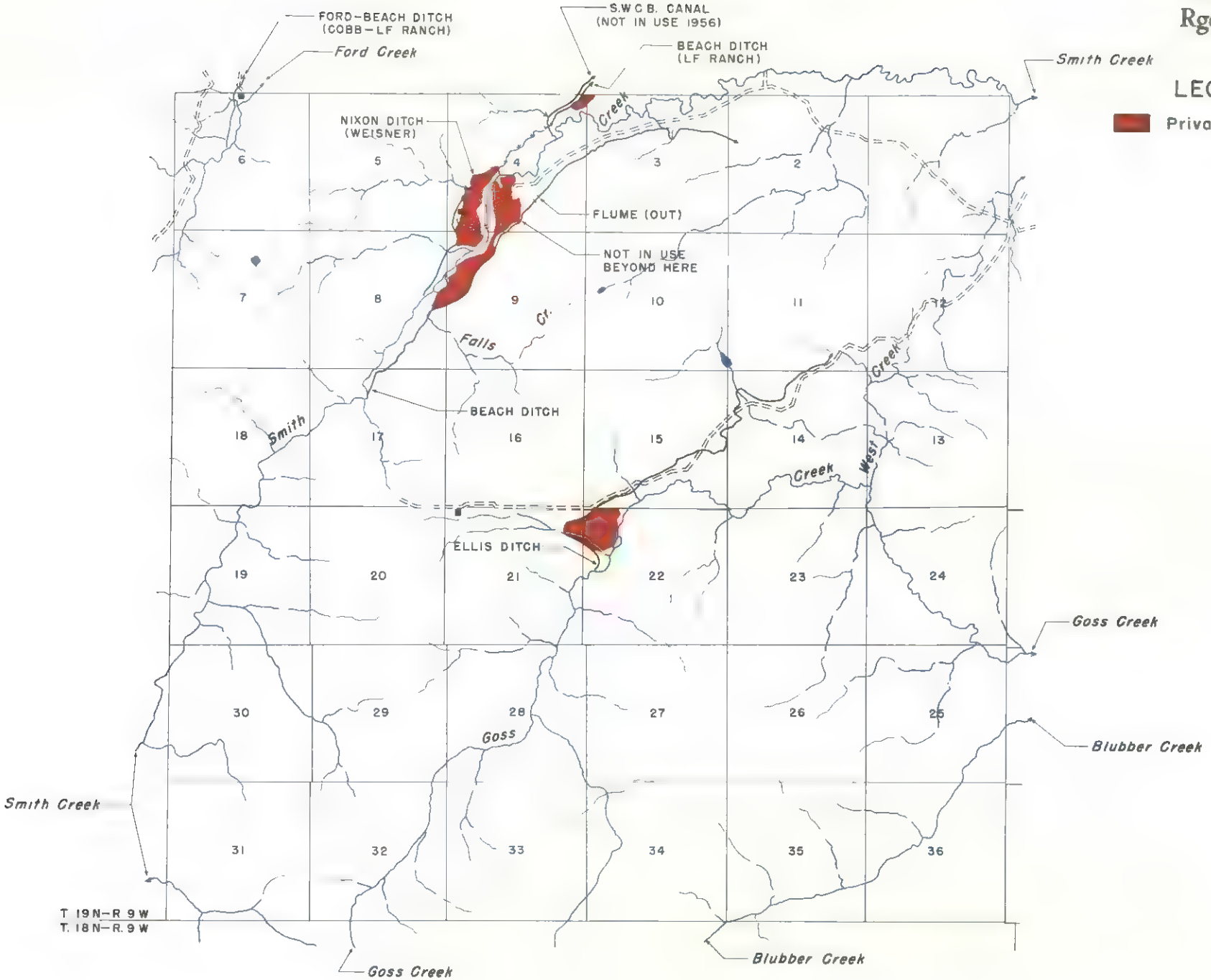
Twp. 19 NORTH
Rge. 6 WEST



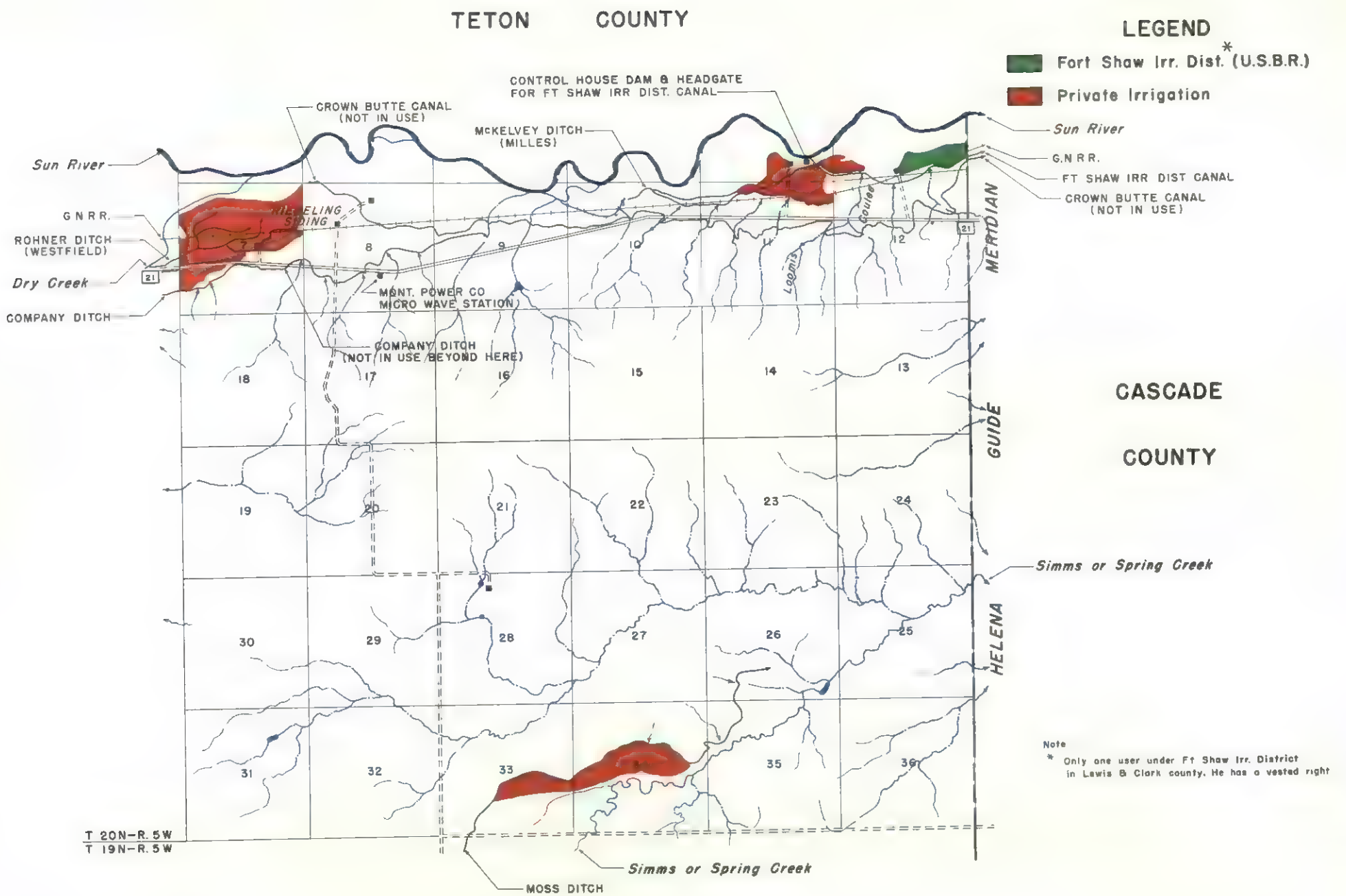
Twp. 19 NORTH
Rge. 7 WEST



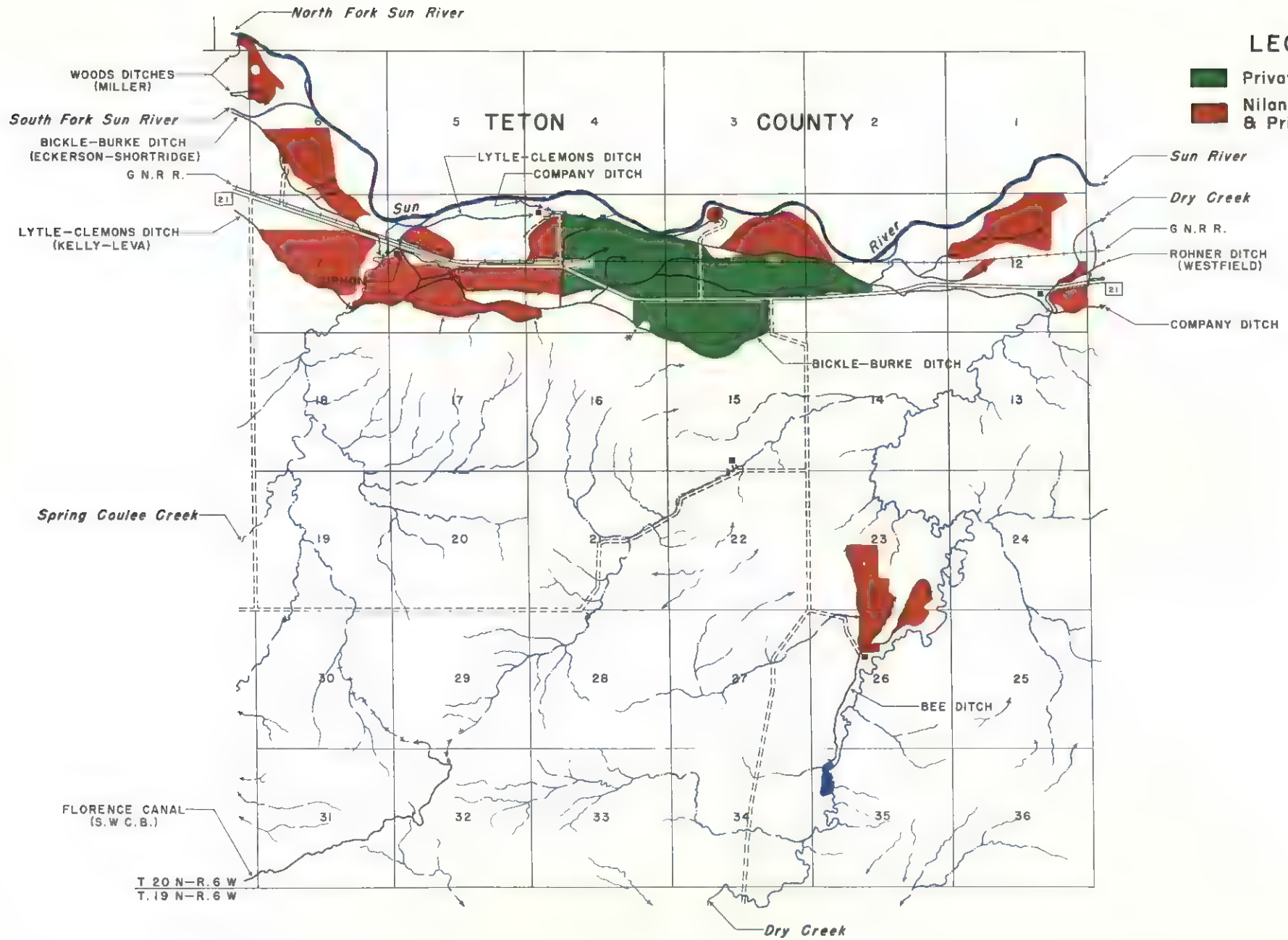
Twp. 19 NORTH
Rge. 8 WEST



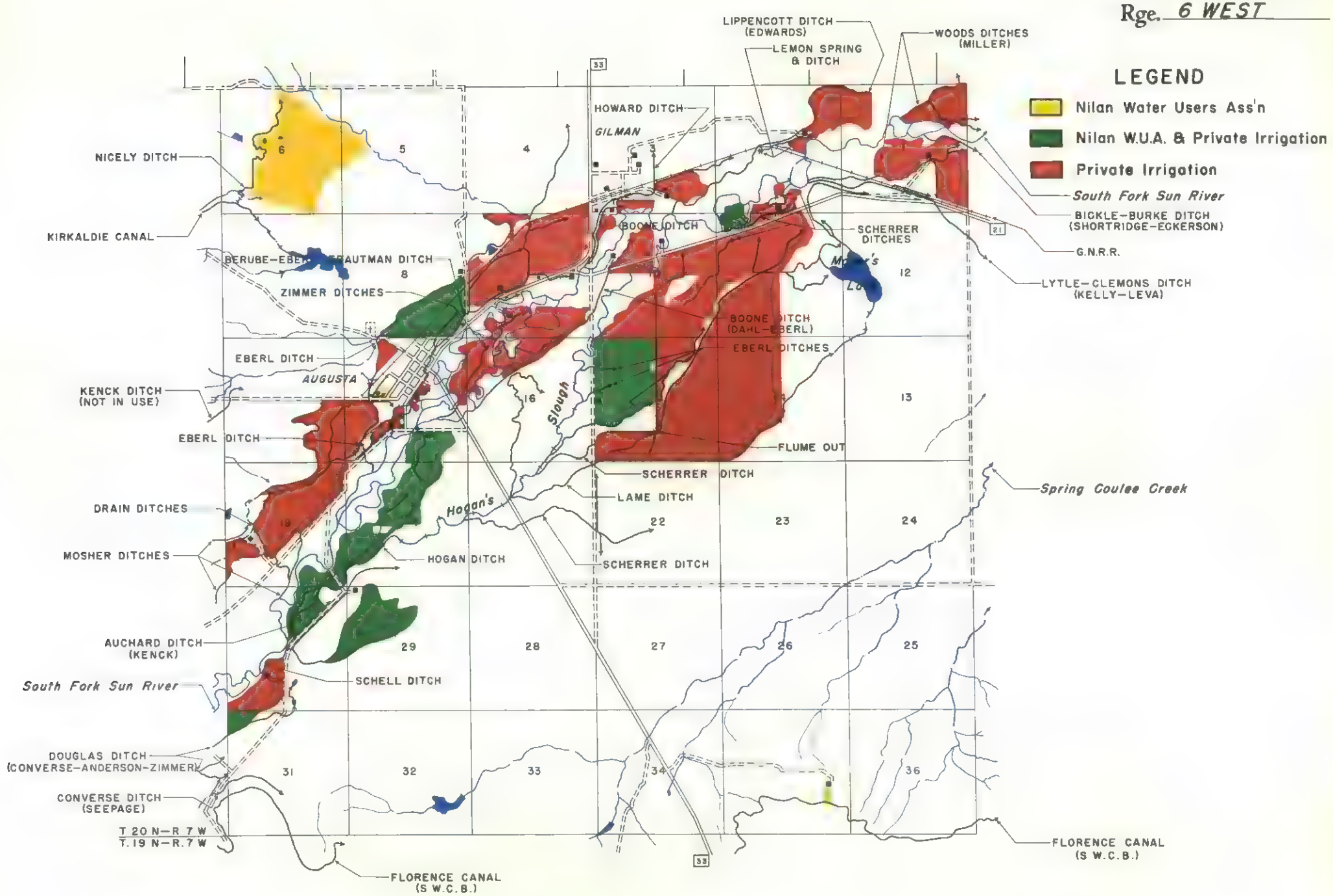
Twp. 20 NORTH
Rge. 4 WEST



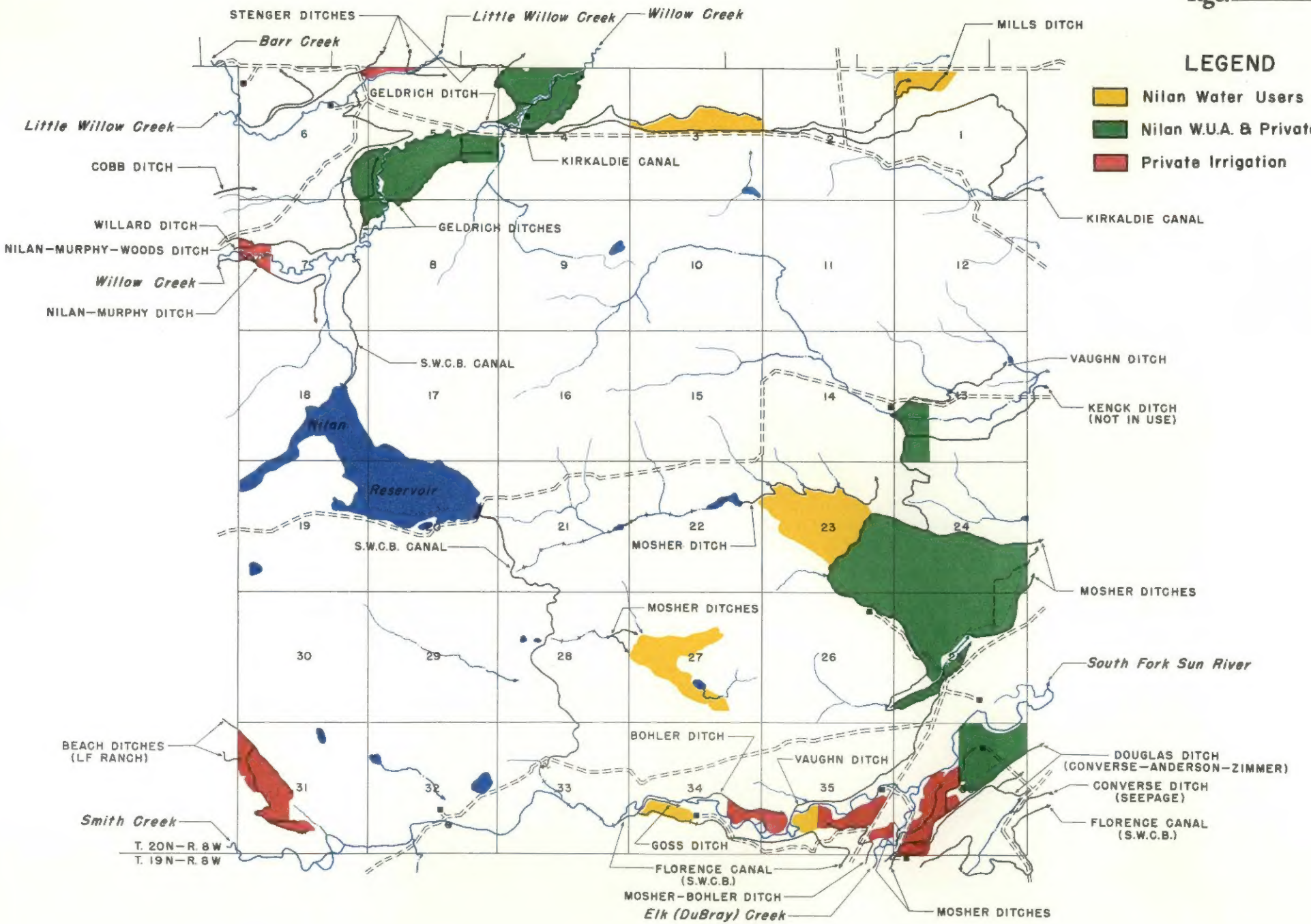
Twp. 20 NORTH
Rge. 5 WEST



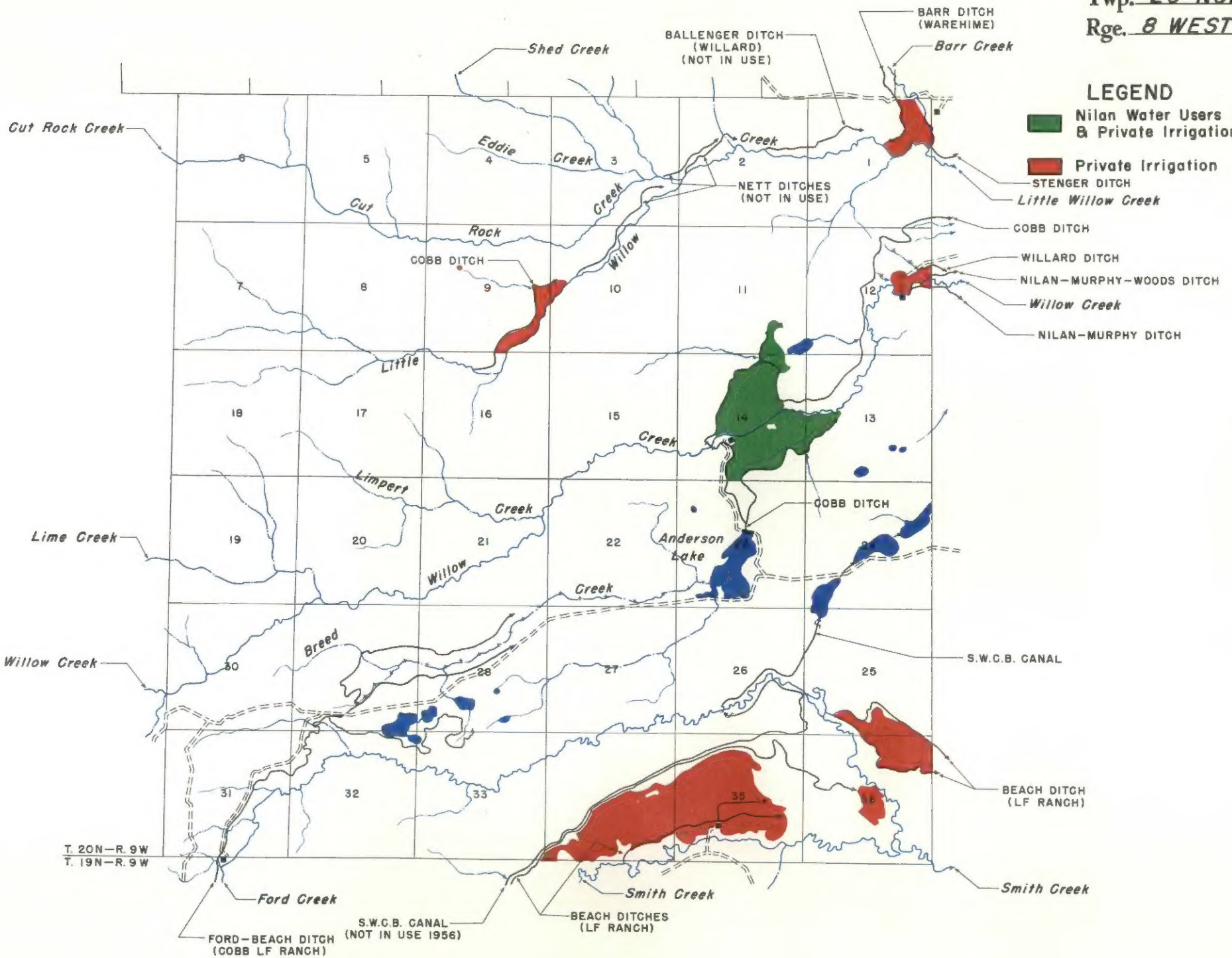
Twp. 20 NORTH
Rge. 6 WEST



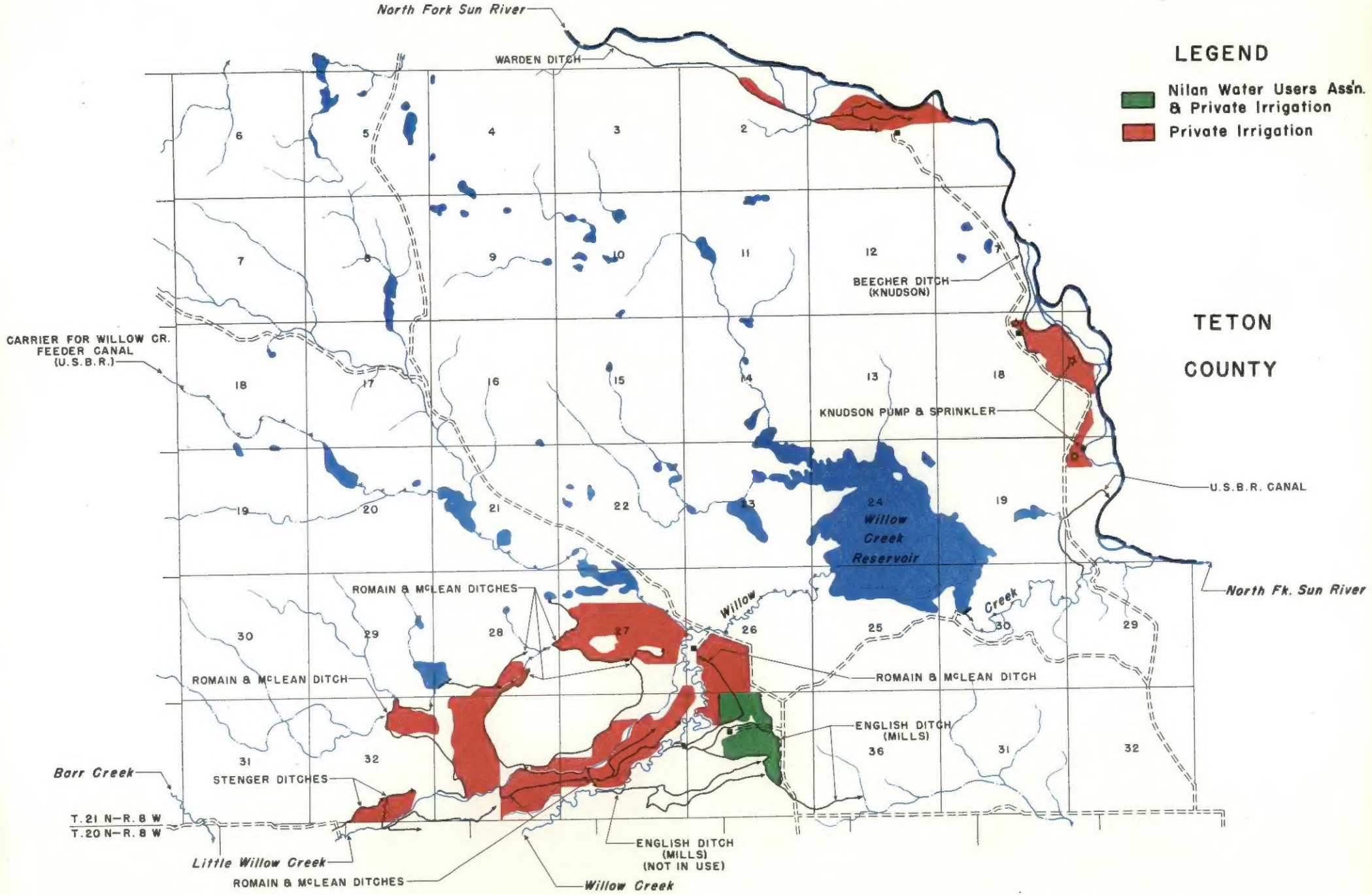
Twp. 20 NORTH
Rge. 7 WEST



Twp. 20 NORTH
Rge. 8 WEST



Twp. 21 NORTH
Rge. 6 & 7 WEST



Twp. 21 NORTH
Rge. 8 WEST